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ABSTRACT

The study investigated the interaction of personal and environmental factors influencing seventh graders' selection of career exploration courses for increased exploration in the eighth grade. A stratified random sample (496 students) was drawn from the Pittsburgh Public School's Occupational, Vocational, and Technical Exploratory Program. Personal and environmental factors included: (1) achievement subscores for industrial arts/home economics/business education; (2) factors of age, race, breadwinner's socioeconomic status, and home school; (3) vocational attitude maturity; (4) motivation; (5) occupational values of interest and satisfaction, salary, prestige, and security; (6) attitude scores for industrial arts/home economics/business education; and (7) student self-reports on teacher/program/peer influence on course choices. The dependent variables were 12 career exploration courses in rank order of popularity. Computations included Pearson product moment correlation, multiple regression analysis, and Behrens-Fisher t-tests. Some conclusions were that exploratory business education courses can successfully be implemented at the middle school and that it is possible to design learning activities which appeal to a wide range of student backgrounds. Sex, race, and occupational value-security were the most frequently appearing and stable influencing variables. Career exploration course selection by preadolescents is only moderately explainable by personal/environmental analysis. (Author/EA)

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An Abstract of a Research Report:

The Interrelationships of Preadolescents' Student Characteristics Influencing Selection of Career Exploration Courses

by

Merrill L. Meehan

Industrial Arts Education Monograph Series, Number One

The Pennsylvania State University
University Park, Pennsylvania

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The central purpose of this study was to investigate twenty selected personal and environmental factors which influence seventh grader's selection of career exploration courses for increased exploration in the eighth grade. Thus, this was a study of the interaction of personal and environmental factors involved in the career decision-making process of urban preadolescents.

From a population of 3,479 students enrolled in Phase II of Pittsburgh, Pennsylvania Public School's Occupational, Vocational, and Technical Exploratory Program, a proportionately stratified random sample of 496 students was drawn. A battery of seven instruments was administered to the intact groups by their regular teachers. Student data were also obtained from printouts of school district maintained files.

Personal and environmental factors representing the independent variables of the study included: (a) three achievement test subscores for the disciplines of industrial arts, home economics, and business education, (b) socioeconomic factors of age, race, breadwinners socioeconomic status, and home school (public or parochial), (c) vocational attitude maturity, (d) motivation, (e) four occupational values of interest and satisfaction, salary, prestige, and security, (f) three attitude scores representing the disciplines of industrial arts, home economics, and business education, and (g) student self-reports of amounts of teacher, program, and peer influence on course choices. The dependent variables in this study were twelve career exploration courses in their rank order of popularity that students could choose.

Descriptive statistics were obtained from the total sample of 496 students. Inferential statistics were from the subsample repre-

senting students with complete data; the subsample numbered 157. Pearson product moment correlations were computed among all the independent variables, and between the independent and dependent variables. Multiple regression analysis was computed for each career exploration course to obtain the amount of explained variance in the criterion and to locate significant predictor factors. Last, Behrens-Fisher t-tests were computed for all variables between those choosing and those not choosing each course for eighth grade.

Among the major conclusions of this study were the following:

1. The career exploration program described in this study has demonstrated that business education courses of an exploratory nature can successfully be implemented at the middle school level.
2. The career exploration program described in this study has successfully demonstrated that it is possible to design learning activities that appeal to all of the wide range of physical growth patterns, religious backgrounds, and socioeconomic status levels represented by the sample.
3. The urban preadolescents in this study who were exposed to a year of career exploration activities chose courses for further exploration for a variety of reasons and were influenced by a mix of factors including values, interests, abilities, and socioeconomic variables.
4. Career exploration course selection by preadolescents is only moderately explainable by a study of the combination of personal and environmental factors included in this effort.

5. The factors sex, race, and occupational value-security were the most frequently appearing and also the most stable influencing variables on preadolescents' course selections in the career exploration program.
6. The occupational value of salary did not significantly help predict the selection of any of the career exploration courses and achievement on subtests representing the disciplines of industrial arts, business education, and home economics proved to be very weak influencing agents.
7. Students enjoyed the activities of the career exploration program and responded favorably to attitudinal items about the program, however the average number of items correctly answered on a criterion-referenced test was only 53.3%.

PREFACE

The past decade has witnessed an extraordinary surfacing of demands from many sectors for proof of excellence in schools. Parents, as well as the general public, have acted on the general belief that educators must be responsible for and account for achievement in schools. In effect the public is expecting, perhaps demanding, information related to the quality of educational programs.

Today as educational programs are proposed and implemented, increasing attention is focused on the relationship between program goals and program outcomes. In addition to pressure from the public sector, there are other factors which have created the present emphasis on program evaluation. Increased costs, improved evaluation strategies, the availability of funds to support evaluation studies, and also an interest by educators themselves to know the effectiveness of the programs they propose are a few factors which can be identified readily.

Industrial Arts Education Monograph Series, Number One, the first in a series to be published when a topic of significant importance and interest emerges, focuses on Pittsburgh's OVT Program. Twenty selected personal and environmental factors were investigated to determine the extent to which they affected the career decision-making process of students in grade seven. It is important to note that this study went beyond other previously completed evaluative studies of the OVT Program. As such, it has contributed to the understanding of the effectiveness of the OVT Program, and also suggests directions for program improvement.

Ronald Koble

Ronald L. Koble
Chairman, Industrial Arts Education
The Pennsylvania State University

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CHAPTER I

INTRODUCTION

Background

The term "career education," signifying a major thrust for American education, was introduced by the then Commissioner of Education, Dr. Sidney P. Marland, in a speech delivered on January 23, 1971. However, the foundations for such an emphasis are deeply rooted in the history of our society. Indeed, Roe (1956, p. 4) concludes that all societies, even the most primitive, must have work roles in order for life to be maintained. If the goal of education is preparation for life, then schools must prepare students for work and the work ethic (Hoyt, Evans, Mackin, and Mangum, 1972, p. 14).

The foundations for the concept of career education in American education originate from four major sources. They include: (a) federal legislation supporting elements of career education, (b) major statements of goals for American education postulated by influential education groups, (c) the rapid growth of research efforts and knowledge concerning career development, and (d) dissatisfaction with schools and their programs.

American citizenry, through its legislators, have consistently formulated laws supporting many elements of the career education concept. The Morrill Land Grant Act, the Smith-Hughes Act, the National Defense Education Act, and the Vocational Education Act are examples of such legislation. More recently, legislation concerned with components of career education includes the 1968 Vocational Education Amendments Act. Other legislation supporting components of the career education concept include The Elementary and Secondary Education Act, The Higher Education Facilities Act, The Appalachian Regional Development Act, and The National Vocational Student Loan Act (Leighbody and Small, 1968).

The foundations of a career education concept include elements of the concept found in all major statements of goals for American education prepared by the education profession. Examples include: The Cardinal Principles of Education (1918), The Purposes of Education in American Democracy (1938), Education for all American Youth (1944), and The Central Purpose of American Education (1961). Taken together these statements discussed the importance of each citizen earning a living and thus, contributing to the general welfare; that schools should teach students how to select vocations, understand the requirements of the job, improve their working efficiency, and generally plan their economic life; and stressed the need for higher level job preparation in light of a rapidly advancing technology replacing many unskilled jobs.

The third foundation of career education lies in the expanding body of knowledge resulting from research into career development.[1] Prior to 1950 most time and effort in career development research was spent in what has been labeled the trait-factor approach (Herr, 1972, p. 69). The poor record of success for this approach led to other, newer theories of career development.

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[1] Career development and vocational development will be used interchangeably in this paper; both appear in the literature.

The impetus for the large amount of new research on career development theory began with Ginzberg, Ginzburg, Axelrad, and Herma's book Occupational Choice: An Approach to a General Theory (1951) which discussed the need for such a theory and presented the elements of their theory. Ginzberg and associates proposed that occupational choice was a developmental process, largely irreversible, and that it ended in a compromise. Additionally, they theorized that occupational choice occurred in several stages in the development of an individual. Until the appearance of their book occupational choice was viewed as an event, not a developmental process involving several stages.

Almost at the same time, Super and his associates began the Career Pattern Study, a longitudinal study of junior high boys in a suburban New York city (Super, Crites, Hummel, Moser, Overstreet, and Warnath, 1957; Super and Overstreet, 1960; Super, Starishevsky, Matlin, and Jordaan, 1963). Super's theory hypothesizes that a person chooses an occupation in terms of how well the occupation allows him to function in accordance to his self-concept. This self-concept is largely the result of the individual's interaction of personal characteristics and environmental variables. The interaction occurs within a sequence of life stages: growth, exploration, establishment, maintenance, and decline (Super et al., 1957, pp. 40-41). Further, there are certain developmental tasks to be mastered at each stage before an individual can progress to the next stage. The mastery or nonmastery of these tasks in relation to what should be accomplished at any stage and in comparison to others in the same age group led Super to propose the concept of vocational maturity. Herr (1970) states that Super's self-concept theory has "received the greatest visability, . . . has stimulated the most research, and . . . is the most comprehensive [p. 26]."

Other significant theories of career development have been presented by Roe (1956) and Holland (1973); these will be reviewed in Chapter II.

Dissatisfaction with educational programs from various sources is the fourth foundation of career education. Within the past decade students began to question the relevance of cold, sterile, and sometimes meaningless educational programs when confronted with significant social concerns and an increasingly complex technological society. Educators themselves have been advocating more relevant and humanistic education. Van Til (1971) calls such educators "the compassionate critics" because their common characteristic seems to be an overriding sympathetic concern for the welfare of children and youth in educational settings. Accompanying the dissatisfaction of instructional programs by students and educators has been an increased interest in educational matters by the general public. Recently the public has demanded more accountability from educational institutions.

In summary, although the specific term career education was recently introduced as an effort to reshape and give new meaning and direction to educational programs in American schools, its foundations are firmly rooted in our culture.

Need for the Study

Career education programs in educational institutions are generally divided into three phases or time-oriented segments. At the elementary school level these programs are typically labeled career awareness or orientation, at the middle/junior high school level programs are usually called career exploration, while senior high and post-secondary programs are labeled career preparation (Budke, 1971; Evans, Hoyt, and Mangum, 1973; Goldhammer, 1972; Hoyt et al., 1972; Magisos, 1973; Olsen, 1974; Swanson, 1972).

The major concern of this investigation is with career exploration course decision-making in a planned program of career education. That this area is worthy of research is borne out by Budke (1971) who made an extensive review of available literature on career exploration in grades K to 12 and concluded that "little research is available on specific occupational exploration programs [p. 69]." He also concludes that "the paucity of research in occupational exploration leaves a wide array of areas needing additional research and study [p. 71]."

Jordaan (1963, p. 60) feels that little is known about the manner in which student self and occupational concepts are employed in making vocational choices. "Fundamental questions," says Super (Super et al., 1957) "such as the following remain unanswered. What factors underlie differential choices? How do various influences interact during the process of decision-making? [pp. 2-3]." Tiedeman and O'Hara (1963) concur with Super and state that "little work has been done on the prediction of specific patterns of course decisions per se . . . these types of study should be pursued further [p. 76]."

A lack of research efforts exists which provide information as to what factors influence student career exploration course decision-making. An individual's career development is obviously shaped by a combination of internal and external factors (Evans et al., 1973, p. 63). Herr (1970), in discussing these internal and external factors, says:

> But to explain either of them [decision-making and vocational development], the observer must understand not only how various factors combine, but how they interrelate, the manner in which respective modes enter into the causal processes and the like [p. xi].

The internal and external factors used in this study were selected from the cognitive, socioeconomic, and affective domains. The rationale for such a complete set of student characteristics is in response to the need for comprehensive "descriptions of student behavior [Herr, 1972, p. 86]" which will demonstrate the development or acquisitioning of elements of career development. Super (Super et al., 1963) concludes that "there is a lack of comprehensive data on the interaction of various sociological and psychological factors which conceivably affect patterns of vocational development [p. 93]."

The inclusion of factors from the affective domain represents a major portion of this research effort. Although attitudes as a research construct have played a central role in the fields of social psychology and sociology, "Research on affective responses . . . is a relatively new area in educational research and practice [Kahn and Weiss, 1973, p. 789]." This may be due to the fact that affective instrumentation and quantification developed later or that procedures for such assessment may be more complex than in other domains. Whatever the reason, "Research in the affective domain (changes in interest, attitudes and values, the development of appreciations, adequate adjustments) has been conspicuously absent in vocational education research [Schaefer and Law, 1973, p. 1312]." Following a research study of various factors predicting academic or vocational curriculum choice at the tenth grade level utilizing the same statistical treatment as this study, Kapes (1971) recommended that a similar design to his should be undertaken with the inclusion of other variables "especially from the affective domain [p. 113]."

Presenting data relative to the career development life stage titled growth is the second dimension of this study. The growth life stage encompasses the time span from birth to age 14 and is subdivided into three stages: (a) fantasy (4-10 years), (b) interest (11-12), and (c) capacity (13-14) (Super et al., 1957, p. 40). Super (1957, p. 71) acknowledges that the concept of life stages has not been utilized "as much as it might have in the formulation of research problems or in organizing the data of vocational psychology." Proof of that point is evident in his textbook (1957) in which he devotes a whole chapter to the life stage of exploration with no explanation of the growth stage. He literally proceeds from a listing of all the life stages in career development to an indepth analysis of the exploration stage with no amount of elaboration of the growth stage--the first life stage in career development.

At the very outset of the presentation of a new theory of career development one can understand why researchers would tend to deal with age groups making vocational decisions that are more significant and immediate in their lives. Super et al., (1957) notes that "since the need to make vocational decisions usually does not arise until adolescence, vocational psychologists have tended to neglect the *growth* stage [emphasis in original, p. 38]." Thus, while the literature indicates that career development encompasses the entire life span, contemporary researchers have neglected to research the life stage titled growth. This vocational life stage includes the preadolescent years--10 to 14--ages of the subjects of this study. Thus, this effort serves the dual function of presenting data regarding the growth stage of career development and, at the same time, will present data that adds to the expanding body of knowledge about preadolescent learners.

Super (Super et al., 1957) realizes the need for further research into elements of his theory. He says: "Most of the propositions need further exploration, although the first three are well established and need only verification and clarification of details [p. 80]." It should be pointed out that such verification and clarification for the growth stage has not been evident in the literature. He proceeds to elaborate on what possible determinants of vocational behavior are worth investigation:

> Socioeconomic status, family background, amount of education, general and special aptitudes, and vocational interests have been shown to be important. How they interact in vocational development has not been demonstrated in a conclusive manner [Super et al., 1957, p. 83].

Another point to be made in favor of the need for this investigation arises out of concerns expressed by Herr (1970, 1972). He points out that present theories of career development are based on data drawn from post hoc reflections of basically limited middle class subjects;

subjects that Herr calls "rather privileged, . . . psychologically sound and economically favored individuals [1970, p. 30]." Even though the career development theorists recognize this shortcoming and do not attempt to generalize their theories to populations and groups they do not describe, the need for data drawn from other types of groups is evident. Because the sample in this investigation is randomly selected from the population of an urban city, it responds to Herr's concern for data dealing with vocational development behaviors of the disadvantaged, various races, females, and religious backgrounds (Herr, 1972, p. 68).

The third dimension of the data presented in this investigation involves data from the programmatic efforts of an innovative career exploration curriculum for urban middle school learners. Thus, this dimension of the study represents a form of summative curriculum evaluation, i.e., How well are the instructional materials working? Grobman (1968) defines curriculum evaluation as "reflecting all systematic efforts of a project to assess the strengths and weaknesses of its activities and their usefulness [p. 2]." She further distinguishes between macro-evaluation and micro-evaluation (1968, p. 18), with macro-evaluation asking the broader questions such as: How are the program data related to national norms? Budke (1971) concludes that one of the areas needing research is "evaluation techniques and procedures for occupational exploration programs [p. 72]."

The development and research of Super's self-concept theory of career development was performed in the absence of the numerous career education programs now evident in American schools. This study concerns itself with identifying the determinants from student characteristics that influence vocationally-oriented decision-making after experiencing a planned program of laboratory activities in a variety of career exploration courses. Thus, this effort will contribute to the body of knowledge occurring from career education activities. Herr (1972) established the need for such a contribution:

> The present state of career development is largely descriptive of what happens if no purposeful intervention is convened in the school or in the community to facilitate the process. Thus a systematic approach to such intervention will not only profit the individuals so exposed but will broaden the empirical base from which increasingly meaningful theory can flow [pp. 68-69].

Any innovative curriculum effort could profit from data-based formative and summative evaluation efforts. The need for curriculum evaluation of career education programs has been expressed by the superintendent of Pittsburgh schools, Dr. Jerry C. Olson, in proposing "ongoing evaluation that responds to the goals, and measures the effectiveness of the approaches [1973, p. 292]." Olson proposes a management model for career education, one aspect is that "it [the model] allows for the analyses, collection, and synthesis of data for research purposes," such "Research could be undertaken for the analysis and modification of existing programs [1973a, pp. 302-303]." The heart of Olson's research,

> the data base, as defined in the data chain chart, must contain information and facts about students, personnel, resources, facilities and programs. Program information from each cell will be infused into the filter process of evaluation and criteria setting. Both formative and summative evaluations, in turn, are distributed to system management and operational management personnel [p. 308].

An example of curriculum evaluation implications emerging from the patterns of significant independent variables determined by statistical analysis would be the matter of students' sex. In the Pittsburgh, Pennsylvania school district the OVT Exploratory Program features coeducational classes in its laboratory areas; as such, the program seeks to eradicate traditional sex roles in career cluster areas. Thus, if the data reveals that the variable sex is not a significant independent variable influencing course choice, e.g., boys selecting clothing and textiles or girls selecting manufacturing, then it can be said that the program is effecting its goal of breaking down traditional notions of what is "man's work" and what is "women's work." This could be a major strength of the program.

To sum the need for the study, we have seen that the amount of research performed on the topic of career exploration is small, especially research dealing with the interaction of personal and environmental student characteristics influencing career exploration course choices including affective domain variables. Concomitantly, while career development theorists have stressed the importance of life stages in the development of vocationally-oriented behaviors, little research is reported about the growth stage--ages 10 to 14. This effort will contribute data to the body of knowledge for this vocational life stage and of urban preadolescents in general. Last, this effort will provide summative curriculum feedback to program administrators.

A Career Exploration Program

Since the late 1960's, the Pittsburgh, Pennsylvania public schools have provided career exploration experiences for middle school students enrolled in both public and parochial schools in the city. The Occupational, Vocational, and Technical (OVT) Division administers this innovative program for urban middle school preadolescents. Know formally as the OVT Exploratory Program, it represents an interdisciplinary approach with the industrial arts, home economics, and business education disciplines combining to offer unique learning activities for coeducational classes of urban preadolescents. The OVT exploratory Program has been described by its administrators (Kishkunas, 1968; Lamping, 1970; Markowski, 1974; Olson, 1973a, 1973b) and has been reviewed by others (Budke, 1971; Cochran, 1970; Evans et al., 1973).

Pittsburgh's OVT Exploratory Program is a tri-level plan involving cognitive, affective, and psychomotor career development experiences. At the sixth grade level, students participate in learning activities related to four concepts: personal development/human relations, communications, production, and economics/consumership (Curriculum Committee, 1968, 1971a). An interdisciplinary approach integrates these concepts with "regular" subject matter such as language arts, mathematics, science, and social studies. This integration teaches the importance of academic abilities necessary for entry into and success in various occupations and career areas.

At the second level, coeducational classes of seventh grade students explore the following ten laboratories for a period of three weeks each: visual communications, construction, manufacturing, power and transportation, clothing and textiles, foods and nutrition, health and community services, business communications, information processing, and merchandising (Curriculum Committee, 1969, 1970a, 1971b). A team of three teachers, one each from the industrial arts, home economics, and business education disciplines, plus a paraprofessional, plan and execute learning experiences for groups of approximately 75 students.

Following a middle school theme, student-centered learning activities are conducted in each of the laboratory areas. Depending on the actual instructional area and the time of the year, a student may be an assembler on a production line, a teller offering banking services to fellow "workers," a health inspector, or a salesman selling student-made products in a school-based merchandise mart. Thus, students try out various worker roles in simulated companies. Manipulative experiences with the tools, equipment, materials, and processes of each cluster are combined with cognitive and affective learning experiences to provide each student with systematic activities about possible career roles. The primary purpose of these seventh grade experiences is to provide each student with input as an aid in their decision-making as they select four of the ten clusters to explore in greater depth the next year.

The eighth grade is the third level of Pittsburgh's OVT Exploratory Program. This level is designed to provide each student with nine weeks of further exploration of the four clusters selected at the end of the seventh grade experience (Curriculum Committee, 1970b, 1971c). Increased exploration of the processes, products, skills, and occupations is provided by teacher-prepared learning activity packages. These self-contained instructional packets, when combined with teacher assistance and counseling, permit students to explore the career areas at their individual learning rates. As a result of this exploration, students should be better prepared to make educational and occupational plans on increased knowledge of their interests, abilities, aptitudes, skills, and values related to possible careers.

Statement of the Problem

The central focus of this investigation is selected student characteristics in the cognitive, socioeconomic, and affective domains at the point in time in a career exploration program when, having completed brief exploratory experiences in ten career cluster areas, each seventh grade student selects four courses for further exploration during the next school year. For most students this represents the first opportunity to relate their curricular plans to a consequence of that decision. Put another way, students are permitted to make an educationally and occupationally-oriented curriculum choice of significance and then test the realities of that decision in action. As such, this study is concerned with the dynamics of personal and environmental factors involved in preadolescents' career exploration course selections in a planned program of career education.

The overall purpose of this study is to investigate urban preadolescents' personal and environmental factors associated with their career exploration decision-making. The problem of the study is to gather, present, and analyze student data regarding variables contributing most to preadolescents' career exploration course selections. Generally speaking, this study will investigate the following broad question:

1. What personal and environmental factors of seventh graders and patterns of these factors influence eighth grade career exploration course choices?

More specifically, this study will attempt to answer the following three research questions:

1. What are: (a) the interrelationships between and among twenty selected student factors from the cognitive, socioeconomic, and affective domains,[2] and (b) the relationships between these characteristics and preadolescents' career exploration course choices?
2. To what extent can the variance in preadolescents' career exploration course selections be explained by student factors from the cognitive, socioeconomic, and affective domains for each of twelve courses?[3]
3. What are the patterns among student personal and environmental factors associated with preadolescents' career exploration course choices from the most popular course to least popular course?

Assumptions

1. Human behavior can be viewed from a vocational perspective not unlike a social, psychological, or sociological point of view (Herr, 1970, p. 10).

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[2] Cognitive domain: OVT achievement--industrial arts, OVT achievement--home economics, OVT achievement--business education; socioeconomic domain: age, race, breadwinner's socioeconomic status, home school; affective domain: vocational attitude maturity, motivation, occupational value--interest and satisfaction, occupational value--salary, occupational value--prestige, occupational value--security, attitude of program--industrial arts, attitude of program--home economics, attitude of program--business education, teacher influence, program influence, peer influence.

[3] Construction, manufacturing, power and transportation, visual communications, clothing and textiles, foods and nutrition, health and community services, business communications, information processing, merchandising, business communications simulation, and home and community services.

2. Vocational development is an aspect of personal development and, thus, worthy of scientific investigation (Super, 1957, p. 185).

3. Career-oriented laboratory experiences are a useful method of teaching and learning for urban preadolescent males and females.

4. Given an opportunity, urban preadolescents will select career exploration courses which will be of high interest to them.

Limitations

The following limitations are relevant to this study.

1. This study was limited to students from the Pittsburgh, Pennsylvania school district and students from the Pittsburgh Catholic School district who were enrolled in the OVT Exploratory Program Spring, 1973. The students in the investigation were randomly selected on a proportionally stratified basis to represent the five educational centers that provided the career exploration learning experiences.

2. The data collection phase of this study was performed during the months of May and June, 1973. Administration of data collection devices involved from two to five sessions during this phase of the study.

3. This effort was limited to the extent that teachers involved in this study understood and adhered to the directions specified for each instrument used in the data collection.

4. This effort was limited to the extent that the students involved in the study understood and responded honestly and to the best of their ability on the instruments used in data collection.

Definitions

In order to provide clarification for terms used in this study the following definitions are provided:

Achievement: "(1) Accomplishment or proficiency of performance in a given skill or body of knowledge [Good, 1973, p. 7]." As used in this study, achievement means scores attained on the OVT Criterion Test; industrial arts, home economics, and business education subtests.

Attitudes: "are selectively acquired and integrated through learning and experience; that they are enduring dispositions indicating response consistency; and that positive or negative affect toward a social or psychological object represents the salient characteristics of an attitude [Kahn and Weiss, 1973, p. 761]." Attitudes in this study refer to scores attained on the Student Attitude Questionnaire of the OVT Program, subdivided into the areas of industrial arts, home economics, and business education.

Career Development: "is self development viewed in relation with choice, entry, progress in educational and vocational pursuits [Tiedeman and O'Hara, 1963, p. 46]."

Career Education: "is defined as the total effort of public education and the community aimed at helping all individuals to become familiar with the values of a work-oriented society, to integrate these values into their lives in such a way that work becomes possible, meaningful, and satisfying to each individual [Hoyt in Hoyt, Evans, Mackin, and Mangum, 1972, p. 1]."

Career Exploration: Best defined in terms of observable student behavior as "activities, mental or physical, undertaken with the conscious purpose or hope of eliciting information about oneself or one's environment, or of verifying or arriving at a basis for a conclusion or hypothesis which will aid one in choosing, preparing for, entering, adjusting to, or progressing in, an occupation [Jordaan, 1963, p. 59]." Used within the context of this study, reference is made to such activities in the OVT Exploratory Program.

Career Exploration Course: refers to the laboratory-oriented subject matter offerings in Phase II and Phase III of the OVT Exploratory Program. Specifically, they are: construction, manufacturing, power and transportation, visual communications, clothing and textiles, foods and nutrition, health and community services, business communications, information processing, merchandising, business communications simulation, and home and community services; the latter two are experimental courses and available only in one of the five educational centers in the study (Olson, 1973b, p. 23).

Choice: "(1) Making a free decision as to action among possible alternatives; (2) the existence of freedom in making decisions and acting upon them [Good, 1973, p. 97]." Used synonomously in this study with the term decision-making.

Motivation: "a combination of psychological forces which initiate, direct, and sustain behavior toward successful attainment of some goal which provides a sense of significance [Good, 1973, p. 375]." In this effort motivation is represented by a score on the Junior Index of Motivation (JIM Scale).

Multiple Regression: "A statistical method that uses the values of two or more variables to predict the value of another variable [Good, 1973, p. 486]."

Preadolescent: Synonymous with the term "transescent" coined by Eichhorn and defined as young persons in "the stage of development which begins prior to the onset of puberty and extends through the early stages of adolescence. Since puberty does not occur precisely at the same chronological age in human development, the "transescent" [i.e., preadolescent] designation is based on the many physical, social, emotional and intellectual changes that appear prior to the puberty cycle to the time when the body gains a practical degree stabilization over these complex changes [Eichhorn, 1968a, p. 111, 1968b]."

Socioeconomic Status: "The level indicative of both the social and the economic position of an individual or a group [Good, 1973, p. 558]." Socioeconomic status, in this study, is a single score compiled from educational and occupational information.

Vocational Maturity: "is used to denote the degree of development, the place reached on the continuum of vocational development from exploration to decline. Vocational maturity may be thought of as a vocational age, conceptually similar to mental age in early adolescence [Super, 1957, p. 186]." Here vocational maturity represents the score attained on Crites' Vocational Development Inventory, Attitude Scale.

CHAPTER II

REVIEW OF RELATED LITERATURE

In order to place the proposed investigation in perspective, a review of the literature was conducted so as: (a) to establish the theoretical framework for the study, (b) to locate relevant thoughts and data pertaining to the career exploration concept, and (c) to report on research studies involving the student factors used in this study. The major criterion for selection of studies reported in the last category was that they must have included the middle/junior high school years; this was necessary because of the large volume of literature pertaining to student characteristics at the adolescent and adult age levels.

Theories of Career Development

The large amount of new research on career development theory began with Ginzberg, Ginzburg, Axelrad, and Herma's book Occupational Choice: An Approach to a General Theory (1951) which proposed that occupational choice was a developmental process, largely irreversible, and that it ended in a compromise. Ginzberg and associates theorized that occupational choice occurred in several stages in the development of an individual. These three stages are: fantasy, before age 11; tentative, between 11 and 17; and realistic, between 17 and young adulthood.

The best known advocate of the developmental approach to career development is Donald Super of Teachers College, Columbia

University. With the start of his Career Pattern Study in 1951, Super began twenty-five years of research designed to trace the career development of males from junior high school through adulthood. He proposed two major constructs in his explanation of the developmental nature of vocational behaviors; these are vocational maturity and self-concept (Super et al., 1957). The importance given to the development of these theoretical constructs in each life stage is the major contribution of Super's work.

Super's proposal that vocational development can be thought of in terms of identifiable life stages was not unique to him. Super drew upon the Austrian psychologist Buehler and adapted ideas from Ginzberg and associates for his life stages formulation. Buehler, as reported by Super (Super et al., 1957, Ch. 3; Super, 1957, p. 71), first proposed the life stages of growth, exploration, establishment, and maintenance in 1933. To these life stages, Super drew upon the early work of Ginzberg and associates in stating that the vocational development process is an ongoing, continuous, and generally irreversible process that is predictable (Super et al., 1957, p. 89). These statements are compatible with those made by Ginzberg et al. (1951) in discussing their earlier effort. Ginzberg et al., also proposed life stages, but they differ in number and ages from Super's.

Super synthesized the aforementioned efforts and combined these thoughts with others from the fields of adolescent psychology, developmental psychology, and industrial sociology. Specifically, Super's description of the resultant life stages are presented here, the first stage will be presented in detail because of its significance to this study, others are summarized:

1. Growth Stage (Birth-14)
   Self-concepts develop through identification with key figures in family and in school; needs and fantasy are dominant early in this stage; interest and capacity become more important in this stage with increasing social participation and reality-testing. Substages of the growth stage are:
   FANTASY (4-10). Needs are dominant; role-playing in fantasy is important.
   INTEREST (11-12). Likes are the major determinant of aspirations and activities.
   CAPACITY (13-14). Abilities are given more weight; and the job requirements (including training) are considered.

2. Exploration Stage (Age 15-24)
   TENTATIVE (15-17)
   TRANSITION (18-21)
   TRIAL (22-24)

3. Establishment Stage (Age 25-44)
   TRIAL (25-30)
   STABILIZATION (31-44)

4. Maintenance Stage (Age 45-64)

5. Decline Stage (Age 65 on)
   DECELERATION (65-70)
   RETIREMENT (71-on) [pp. 40-41].

Within this same publication (Super et al., 1957) the authors theorize about the developmental tasks associated with each of the life stages. Their thinking is that the vocational development process can be examined through an analysis of the vocationally-oriented developmental tasks associated with each life stage. They present a list (p. 44) of twenty-one such important vocational development tasks. The list is organized into school age groups up to the adulthood stage and significant to this study is the lack of a junior high school or middle school age child classification category; the list proceeds from the elementary school child category to the high school adolescent category, with no mention of preadolescent tasks.

Of special importance to this research effort is Super's discussion of the necessity of understanding ongoing vocational behaviors through an examination of the determinants of it. Super et al. (1957), in both Chapters III and V of the monograph and appendices suggests that the possible determinants might include such factors as the development of roles and the self-concept, intelligence, special abilities, interests, values, attitudes, personality, and numerous situational and environmental factors (pp. 48-53; 81-83; 116-128). These listings of possible determinants of vocational behavior were the major input regarding selection of student factors for this investigation.

The 1957 monograph by Super and associates is important because they bring all of their collective thought and ideas concerning the developmental nature of career behaviors together in Chapter VI. Titled "Implications for Further Research," the authors present a set of eleven propositions that represent all aspects of their theory. Recognizing their importance to this study, the eleven propositions will be reproduced in full.

> *Proposition 1.* Vocational development is an ongoing, continuous, and generally irreversible process.
>
> *Proposition 2.* Vocational development is an orderly, patterned process and thus predictable.
>
> *Proposition 3.* Vocational development is a dynamic process of compromise or synthesis.
>
> *Proposition 4.* Self-concepts begin to form prior to adolescence, become clearer in adolescence, and are translated into occupational terms in adolescence.

> Proposition 5. Reality factors (the reality of personal characteristics and the reality of society) play an increasingly important part in occupational choice with increasing age, from early adolescence to adulthood.
>
> Proposition 6. Identification with a parent or parent substitute is related to the development of adequate roles, their consistent and harmonious interrelationship, and their interpretation in terms of vocational plans and eventualities.
>
> Proposition 7. The direction and rate of the vertical movement of an individual from one occupational level to another is related to his intelligence, parental socioeconomic level, status needs, values, interests, skill in interpersonal relationships, and the supply and demand conditions in the economy.
>
> Proposition 8. The occupational field which the individual enters is related to his interests and values, the identifications he makes with parental or substitute role models, the community resources he uses, the level and quality of his educational background, and the occupational structure, trends, and attitudes of his community.
>
> Proposition 9. Although each occupation requires a characteristic pattern of abilities, interests, and personality traits, the tolerances are wide enough to allow both some variety of individuals in each occupation and some diversity of occupations for each individual.
>
> Proposition 10. Work satisfactions depend upon the extent to which the individual can find adequate outlets in his job for his abilities, interests, values, and personality traits.
>
> Proposition 11. The degree of satisfaction the individual attains from his work is related to the degree to which he has been able to implement his self-concept in his work [pp. 88-96].

The second Career Pattern Study (Super and Overstreet, 1960) focused on the vocational maturity of ninth grade boys. The authors felt that since vocational maturity was a valid construct, it could help provide insight into the vocational development process. They state, "When the individual is ready to begin vocational planning he will presumably do so more effectively than when, in terms of his vocational development, he is not yet ready [Super and Overstreet, 1960, p. 10]." Vocational maturity was, thus, viewed as one indicator of readiness for such planning. A measure of this construct of vocational maturity should be able to differentiate between students who are not ready to make vocationally-oriented decisions and those that are ready. The authors conclude that "more research-derived knowledge of the developmental sequence of vocational and the determinants of vocational behavior is needed [p. 11]."

On the basis of factor analysis techniques, Super and Overstreet (1960, Chapter III), identified six indices of vocational maturity. They are: (a) concern for choice, (b) acceptance of responsibility for choice and planning, (c) specificity of information about the occupation, (d) specificity of planning for the occupation preferred, (e) extent of planning, and (f) use of resources.

Super and others (1963) presented another publication which further delineated their theory in terms of the areas of self-concept and exploratory behavior. The development of self-concepts take on added meanings as the individual views himself in different roles and situations, including occupational ones. In making an occupational choice, an individual is attempting to implement his self-concept (Super et al., 1963, p. 13). Moreover, as an individual progresses through adolescence both his self and occupational concepts become clarified in terms of his interests, values, and capacities (1963, pp. 84-89). Thus, an individual can be described in terms of his self-concept system which is the organized network of all his self-concepts.

To summarize Super's theory of vocational development it can be characterized as being a developmental theory drawing heavily on the constructs of vocational maturity and self-concepts. He and his associates have presented several publications describing the theory and research efforts. Super's life stages of growth, exploration, establishment, maintenance, and decline and their associated developmental tasks constitute a major portion of his contributions. Further, he has summarized all of his theory into eleven propositions that invite further research for verification. It is the investigation of the growth stage that is the focus of this study.

Roe (1956) presented a theory of career development drawing heavily on Maslow's (1954) theory of personality needs and the influences of early childhood development. The development of early interests "towards persons" or "not towards persons" leads logically, she says, to the classification of occupations into eight separate groups along these lines. Further, parental child-raising techniques and parent-child interactions together with skill attainment leads individuals to seek varying levels of autonomy and responsibility in occupations; this dimension was labeled level by Roe. The resulting eight groups by six levels comprise a 48 cell matrix; this taxonomy of occupations is the best known feature of her theory of career development (Kapes, 1971, p. 4).

Holland (1973) first presented a personality-oriented theory of career development in 1959 that has since stimulated over 100 research studies. Holland (1973) states "that choice of a vocation is an expression of personality [p. 6]." This theory states that individuals in our culture can be characterized by their resemblance to six basic personality types: realistic, investigative, artistic, social, enterprising, and conventional. Similarly, the environments in which people work and live closely resemble personality types, i.e., the same six types previously named. The pairings of persons and environments leads to understandable and predictable behaviors based on knowledge of the climate that each produces. Holland concludes that "evidence supports the main hypothesis of the theory. The [personality] types appear to grow up, perceive occupations, search for occupations, move among occupations, and behave according to theoretical expectations [1973, p. 82]."

Career Exploration

Educators typically differentiate between contemporary career education programs on the basis of labels derived from common practice and usage, e.g., awareness, exploration, and preparation. However, such distinctions of differences appear to be more artificial than real because of the developmental nature of career-oriented behaviors (Ginzberg et al., 1951; Super, 1957; Tiedeman and O'Hara, 1963). It appears that, although helpful to educators in communicating levels of career education programs, the distinction between career awareness and career exploration as specific age grade designations suffers when subjected to theoretical analysis.

The term career exploration also suffers from varying definitions and interpretations. At different times and by different authors, career exploration can mean a life stage, a process, a program, outcomes of processes and program, or a goal.

Tennyson (1973) states that "career exploration has often been defined as a life stage in vocational development [p. 63]." The importance of exploration in career development theory was first stated by Ginzberg et al. (1951), when they discuss it as a substage of their realistic stage of vocational development. Super (1957; Super et al., 1957, Super et al., 1963) gives credit to Buehler for his formulation of the developmental life stages of career development and indicates that the exploration stage involves the years of fifteen to about twenty-four. According to Super (1957),

> Adolescence is, clearly, a period of exploration. It is a period in which boys and girls explore the society in which they live, the subculture into which they are about to move, the roles they may be called upon to play, and the opportunities to play roles which are congenial to their personalities, interests, and aptitudes [p. 81].

When career exploration is considered as process, emphasis is on the dynamics involved and the evolving nature of exploration. Herr (1972, p. 73) feels that it is important at the early and mid-adolescent years to engage in occupational and educational information in a process of vocational exploration. Evans et al. (1973) assert that: "It [career education] is a process through which this exploration can occur so far as productive achievement, career choice, and career performance are concerned [p. 30]." Tennyson (1973, p. 111) regards career exploration as a developmental process. Jordaan (1963, pp. 42-78) provides the most thoughtful consideration of exploratory behaviors in relation to self and occupational concepts. He views career exploration as being essentially problem solving behavior. The nature of the process by which the learner arrives at new knowledge and discovery determines whether or not it is exploratory. Exploratory behavior, according to Jordaan, must include these five elements: search, experimentation, investigation, trial, and hypothesis-testing (p. 54).

Career exploration can be considered a program when the emphasis is on the features, i.e., personnel, strategies, learning activities, or evaluation procedures involved. Such features are typically discussed by educators when communicating educational programs. Budke (1971) provides such a definition:

> Occupational [career] exploration broadly defined will generally describe organized educational efforts directed at exposing students to a wide spectrum of career occupations through discussion, films, resource persons, and field trips, as well as exploration of their interests and abilities through manipulative skills and simulations in a laboratory or a work setting [p. 4].

Career exploration can be considered as outcomes when emphasis is placed on observable behaviors resulting from conscious or unconscious acts by the learner. Here, significance may be on changed behaviors regarding the developmental tasks associated with vocational development. These outcomes may be the results of a planned program as advocated above. Concern is not so much with the dynamics of the processes as with particular outcomes being observed and studied. Super (1957, p. 310) presents such a point of view when declaring that vocational exploration is the process of clarifying the self-concept and translating it into occupational terms. Emphasis is on the resultant translation. Jordaan (1963, pp. 59-60) prepared a list of twelve specific outcomes of career exploratory behavior.

Finally, career exploration may be a goal statement for a teacher, administrator, school system, state or regional system, or an organization. Such an influence is expressed by Kapes (1971): "Exploration, then, is the appropriate emphasis for education in the middle schools and junior high schools [p. 9]."

Recent interest in career exploration experiences by educators is due, in part, to knowledge of the developmental nature of vocationally relevant decisions and behaviors. In fact, the school has been described as the "exploratory institution par excellence [Super, 1957, p. 85]." After an extensive review of career education programs reported in the literature, Evans et al. (1973) concluded an "almost universal agreement exists on viewing the middle/junior high school years as concentrating on career exploration activities [p. 100]." Budke (1971, p. 69) determined that career exploration programs at the junior high school level are both the most numerous and highly developed.

Expertise in providing career exploratory programs by middle/junior high schools is understandable since this was one of the original tenets for the formation of junior high schools in America (Moss, 1969, pp. 6-9). More recently, the middle school concept is postulating that this is the proper time when student responsibilities, through planning activities, can be related directly to consequences of the decisions made (Budke, 1971, p. 17). Social and sexual roles and skills are the only middle/junior high school concerns outranking career considerations (Evans et al., 1973, p. 9) and these same authors declare that omission of the elements of career education at this level means the institution is neglecting its duty. Career exploration programs in the middle/junior high schools answer the need for systematic strategies for occupational information and exploration permitting preadolescent learners to gradually and methodically assess and evaluate their interests, aptitudes, values, and abilities in relation to the world of work.

Career exploration programs in schools vary considerably in nature. Overall, present career education programs at the middle/ junior high school level stress occupational exploration at the expense of self-exploration in relation to work roles (Herr, 1972, p. 65; Tennyson, 1973, p. 111). Of primary concern at this level is the integration of vocational values and information into the school curriculum along with the relationship between subject matter content and careers (Herr, 1970, p. 56). Career development literature is providing educators with propositions and principles for the organization and structuring of career exploration learning activities. Career exploration learning activities, thus designed, will purposely utilize various stimuli and information regarding work and work roles in order "to perpetuate a continuing clarification of self, including one's needs, interests, attitudes, values, and work role perceptions and competencies [Tennyson, 1972, p. 104]."

Jordaan (1963, pp. 42-78) provides the most extensive presentation of exploratory behaviors in relation to self and career-oriented behaviors. He claims that "exploratory behavior not merely modifies but plays a crucial role in shaping the way in which a person thinks about himself and about the world of work [p.60]." Exploratory behavior is not only physical, it can be purely mental activity. Similarly, a person may or may not realize that he is exploring. According to Jordaan, such exploration is multidimensional; any given behavior could be placed in several continua. He lists ten such continua.

The most important contribution of Jordaan is his criteria for assessing when learner behaviors are exploratory or not. To differentiate exploration from orientation, he concluded that such behaviors must be problem-solving in nature. Behaviors can be considered exploratory only when they involve the qualities or search, investigation, trial, experimentation, and hypothesis-testing (p. 56). Thus, exploration need not take place in a vocational setting to be vocationally relevant; e.g., exploration could easily involve library research. In summarizing his thoughts, Jordaan says:

> Vocational exploratory behavior refers to activities, mental or physical, undertaken with the more or less conscious purpose or hope of eliciting information about oneself or one's environment, or of verifying or arriving at a basis for a conclusion or hypothesis which will aid one in choosing, preparing for, entering, adjusting to, or progressing in an occupation [p. 59].

In sum, we can say that career exploration is a widely accepted term used to describe any one or combination of the following: (a) a life stage, (b) processes, (c) programs, (d) outcomes, or (e) goals. However, the use of the term career exploration for time-oriented designations is hardly defensible from a theoretical perspective. Student exploratory behaviors in regard to self and occupation concepts are best denoted by their inclusion of hypothesis-testing.

Investigations Including Factors Used In This Study

Twenty student variables were chosen for this study on the basis of rational and empirical analysis. These variables fall within the cognitive, socioeconomic, and affective domains and will be examined in that order.

Three variables from the cognitive domain chosen for inclusion for this study represent the three subtest scores for the disciplines of industrial arts, home economics, and business education attained through the administration of the instrument titled OVT Criterion Test, Phase II.

The OVT Criterion Test, Phase II (OVTCT) was developed by the American Institutes for Research (AIR) in 1971 especially for curriculum evaluation efforts sponsored by the funding agency and results have appeared in three reports submitted to the Pittsburgh school system (Rosenfeld, Schubert and Collins, 1971; Schubert and Rosenfeld, 1972; Schubert, 1973). Development of the OVTCT was a joint effort of the program evaluators and the OVT Exploratory Program teaching staffs of the education centers. Project teachers submitted two knowledge-oriented test items for each of the official behavioral objectives in their teaching specialty area. The resultant lists of test items were reviewed by a panel of teachers which selected those items which reflected current teaching-learning practices at the education centers. These items were submitted to the AIR evaluation team for final editing and test construction. This resulted in the 50 item instrument.

Rosenfeld, Schubert and Collins (1971) report that the results of the first year's administration would provide baseline date for subsequent administrations. Being unique to the program, the OVTCT test results were not comparable to other types of tests from other programs. Results reported were total test scores and each career exploration course subscore for males and females separately and divided into the two educational centers at that time. Analysis of the results showed: (a) scores for sexes were essentially the same, (b) mean scores for the two OVT centers were also very similar, and (c) several individual items were judged too difficult to be useful.

A second administration of the OVT Criterion Test, Phase II was reported by Schubert and Rosenfeld (1972). The 45 item shortened version OVTCT was given to a random sample of students of Phase II in four OVT centers during the Spring of 1972. Average achievement level was 61% of items answered correctly. Although mean score results were reported for each OVT center and its feeder schools, subscores for each course by OVT center, and item analysis data were presented, no Kuder-Richardson 20 value was reported. The AIR evaluation team did not report subtest scores reflecting the three subject matter disciplines of the OVT Exploratory Program. During the Spring of 1973, evaluation emphasis was placed on other aspects of the total OVT program and the OVTCT was not administered as reported by Schubert (1973).

Five variables from the socioeconomic domain were included in this investigation. Specifically, they include age, sex, race, socioeconomic status, and religious orientation. Support for this inclusion from a theoretical point of view has been established in the need for the study section of Chapter I. In this chapter, we shall be concerned with their use in other research efforts and their relevance to this study.

Innes and Cormier (1973) reported on an effort to devise a nonschool oriented instrument through the use of criterion scaling techniques which could predict school achievement means for a standardized scholastic test for groups as small as 30 in number. Their study was an effort to respond to the need of providing data for the judgment of school instructional programs which includes relevant information in the appropriate categories with factors in the socioeconomic category held constant. Their research was conducted with a sample of eighth grade students derived from fifteen junior high schools in Tennessee. Through the use of criterion scaling techniques, they were able to show correlation between scholastic achievement as measured by a standardized achievement battery and socioeconomic status which was positive .70, to race was positive .34, and to sex was positive .09. The socioeconomic variable alone accounted for 93% of the variance in achievement scores.

Hollingshead's Elmstown's Youth (1949) demonstrated that membership in a given social class structured an individual's life and played a major role in determining his social, educational, and vocational behavior. He found that vocationally-oriented attitudes and behaviors of high school students corresponded very closely to the social class positions of their parents. That is to say that the breadth of an individual's vocational aspirations is closely allied to the choices he can consider, the choices he can make, and the choices he can implement.

Weston (1965) investigated the level of occupational aspiration of 202 fifth grade boys in a suburban Michigan area. He found the following variables to be significantly related to the boys' level of occupational aspiration: father's occupational level, mother's occupational level, father's educational level, and the boys' estimate of parents' educational aspirations for them. Similar importance of the socioeconomic variable was found by Mitchell (1971). Of six variables studied which predicted the criterion measure of seventh grade reading achievement or eighth grade cumulative grade point average, the variable--socioeconomic status--was the best single predictor variable of the eighth grade criterion measure. In this case, socioeconomic status was the single score derived from an analysis of the father's occupation.

Using Project Talent data, Johnson (1964) sought to predict students' entry into four occupational areas; the sample consisted of 201 ninth graders who completed all the Project Talent survey instruments. Using a combination of variables, including several from the socioeconomic domain: (a) socioeconomic background, (b) age, (c) racial background, (d) family level of educational achievement, and (e) court record of delinquency, Johnson was unable to predict occupational choices of students who subsequently enter the secretarial, office clerk, mechanical, or electrical fields of work.

The OVT Exploratory program is specifically designed to be a student-centered learning program for preadolescent learners. As such, the program attempts to meet some of the educational needs of youngsters of this age group who are coping with internal forces caused by body changes and numerous external forces generated by the environment. Eichhorn (1968b) concludes that:

> in our culture, the onset of transescence creates many internal and external pressures for children over which they have little control. This often results in emotional and social anxiety and tension. The adjustment made by transescents to their environment depends largely on growth patterns in relation to cultural expectations [p. 23].

In The Boyce Medical Study, Eichhorn (1973) presents evidence that the age variable would be an important factor for further investigation. The study involved the administration of a very complete battery of medical tests including typical eyes, ear, nose, throat heart, and skin fold examinations and specialized tests designed to determine the level of biological maturation for each subject. The sample consisted of 232 male and 255 female students of Boyce Middle School in suburban Pittsburgh, Pennsylvania. One of the major findings of the study was the concept of developmental age and its impact to educational programming. Eichhorn reports that the development of youngsters varies so much that a developmental age concept might prove very useful for educators (1973, p. 22). The Boyce study sample was categorized into five classifications ranging from possessing no secondary sexual characteristics to complete development of secondary sex characteristics.

Lloyd (1967) attempted to identify and analyze the characteristics of sixth graders that predicted high school graduation or dropout from school. Twenty-one predictor variables were selected from information contained in the school records. These twenty-one measures were correlated with the criterion of subsequent graduation or dropout from school after the sixth grade. The sample was 1,256 males and 1,229 females drawn from a county-wide school enrollment. Multiple correlation analysis was employed with the result being that one of the significant factors which predicted the criterion was age in sixth grade (p. vi).

Sex was included as an independent variable in this study for several reasons. Most importantly, the OVT Exploratory program is coeducational for all of the career exploration courses in an effort to eliminate notions of what is "man's" work and what is "woman's" work. Secondly, literature abounds which attests to earlier occupational stereotyping for girls versus boys, the smaller range of vocational options for girls, and the need for changing attitudes towards the role of women in the work force. In the schools, Grobman (1968) feels that:

> There is sufficient data in the literature documenting boy-girl difference on a variety of achievement and attitude scales to warrant attention to this factor in all statistical treatments of classroom data [p. 32].

A longitudinal type study was conducted by Hays (1965) in order to relate developmental changes in the study sample to recommend junior high school programs that reflect the needs and wants of early adolescents. The time span of the study was three years. As a result of his research, Hays concluded that "the sex of a student is a definite factor in determining occupational interest patterns during early adolescence [p. 2587]." In a similar effort to identify the type of instructional program suitable for the middle school, Vaughn (1970) states that:

> Conclusions drawn from the analysis of research led to guidelines which, if implemented, would radically alter the appearance and emphasis of education in the middle years. The guidelines call for single-sex classes, taught by same sex teachers, student-selected exploratory courses offered in small segments, and "school within a school" team teaching without emphasis on interrelating disciplines [p. 5313-14].

Although career development theorists have said for many years that race, religion, and ethnicicity are closely allied with vocational development and decision-making, little evidence of support for these statements appear in the literature at the middle/junior high school level. Super (1968) says that although religious background appears to affect vocational behavior and development "so far [it has] been given little systematic study [p. 52]." Religious background as a variable in this study will be a function of whether the student's home school is a public or parochial school; this assumes that attendance in a parochial school connotes an orientation toward that religious background. Roe (1956) reports that a few studies reveal Catholic institutions of higher learning producing fewer scientists than do other colleges and universities (p. 243).

Somewhat contrasting results of research studies related to race have been reported. In an effort to discern differences in occupational aspirations between Negro and white youths in grades seven, eight, and nine, Geisel (1963) reports that the 577 Negro boys in his sample of 1,125 students consistently aspired to higher educational and occupational positions than did the white youngsters. However, Conners (1966) reports that, in her study of inner city Washington, D.C., Negro and white junior high school boys, the Negro boys did not aspire to, or expect to actually have, significantly higher social prestige jobs than the white boys (p. 6508).

Several variables from the affective domain were selected for this study in an attempt to increase the efficiency of the statistical methodology. The construct of vocational maturity was one of the first significant concepts to emerge from career development research begun in the early 1950's. Crites' Vocational Development Inventory, Attitude Scale (VDI) was the specific device used to assess vocational attitude maturity of the subjects. Eight years of developmental work on the instrument has been conducted by Crites and he reports on the reliability, validity, and usefulness of the device in a monograph (1971). He reports its use in over 100 research studies up to that date. Initial cross-sectional samples from grades five to twelve numbered 2,822 students while longitudinal samples have varied from 500 to 1,000 students. Major results of numerous applications of the VDI show that: (a) normative data varies considerably from sample to another sample, (b) students from minority group backgrounds score consistently lower than other learners, (c) differences within grades are smaller than between grades, and that (d) reliability coefficients range in the low .70's which the developer considers good given the developmental nature of the construct.

Vocational maturity, both attitude and competence components of the VDI, was the central item of focus in a study of a career exploration program reported by Olsen (1974). Randomly chosen experimental groups of 80 subjects each for the seventh and eighth grade levels were compared to randomly selected control groups from a similar countywide school system in West Virginia. The "treatment" consisted of a planned program of career exploration for the experimental students. Results indicated that the adjusted VDI posttest means were not significantly different between the two groups; therefore, the null hypothesis of significant difference in adjusted VDI, Attitude Scale posttest means was not rejected. Olsen concluded that other data indicated the eighth students received a higher amount of career education experiences than the seventh grade students and this factor could not have been accounted for in the grouped posttest means. He says the "degree of career [vocational] maturity achieved by seventh grade students appears to be highly correlated with the level of career education experiences provided to the students [Olsen, p. 21]."

The rationale for the selection of a measure of motivation reflects the belief that the OVT Exploratory program is more than an instruction program for career exploration, but that it is also an effective means for self-exploration and academic motivation. The Junior Index of Motivation (JIM Scale) was the measure chosen to assess this affective domain construct. After years of development and study, Frymier (1970) was able to report that the index does effectively discriminate between junior high school students according to their desire to do good work in school as defined by their teachers and that there were no important response variations according to sex. Norms were established using a sample of 3,189 students from 38 schools across the country. Normative data have been established for the different regions of the country according to United States Census figures, and also for central city, suburban, and rural student populations.

There were no studies in the literature where academic achievement as measured by the JIM Scale was a measure of expected outcomes in either a career education program at the junior high school level or where the device was used as an independent variable in a multiple correlation technique such as used in this study. Therefore, it was felt that this area was worthy of scientific investigation.

Occupational or work values were included as variables in this research effort because of their importance in choosing a career. Persons with certain occupational values are more likely to be attracted to certain types of work than others. Zytowski (1970) defined occupational values as "a set of concepts which mediate between the person's affective orientation and classes of external objects offering similar satisfactions [p. 176]." He further concluded that a review of literature established approximately fifteen work values as fundamental.

The occupational values measuring instrument used in this effort is the Occupational Values Inventory (OVI) developed by Impellitteri and Kapes (1971b). The authors discuss the development of the OVI in a monograph titled The Measurement of Occupational Values. They say "the OVI was designed so as to include the least possible number of values necessary to adequately sample the occupational values domain relevant especially to young adolescents [p. 13]." Seven values are measured by the OVI: interest and satisfaction, advancement, salary, prestige, personal goal, preparation and ability, and security. The basic format of the OVI is ipsative in nature, meaning that students must actually perform the valuing tasks as they complete the instrument. The reading level of the OVI is that of seventh grade.

Four scales of the OVI were chosen for this study as independent variables in the multiple regression analysis. Use of the OVI in career development research, especially in statistical methodology very similar to that employed in this study, has been very successful as reported in several research monographs emanating from the Vocational Development Study (Impellitteri and Kapes, 1971a) being conducted by the Department of Vocational Education at The Pennsylvania State University. However, none of the monographs report research activities conducted at the junior high school level. Typical of the use of occupational values of the OVI as predictor variables is reported by Kapes (1971). Here the OVI value of prestige was found to be a significant unique predictor of ninth grade students' choice between an academic or vocational curriculum, and also, it was a significant unique predictor of success in the vocational curriculum (p. 116).

The four occupational values used in this study and their definitions (Impellitteri and Kapes, 1971b) are:

1. Interest and Satisfaction--One likes the work; enjoys it; is happy at it; fulfills oneself by doing it.
2. Salary--One perceives the financial return resulting from work; can make a good living at it; sees it as an opportunity for a satisfactory income.
3. Prestige--One is impressed by the respectability attached to the work; can earn recognition from it; desires the feeling of importance that goes with it.
4. Security--One can obtain employment in this work; perceives that workers are needed in it; there will always be openings in it [p. 13].

Student interests and attitudes are a very important consideration in vocational decision-making. Student attitudes toward a program of career exploration courses could prove to be important influences in selection of some courses for further exploration. For this study, three indices of student attitude toward the career exploration program were selected as independent variables. These scores represented the subscores for each of the subject matter disciplines in the OVT program contained in an instrument designed by the AIR in their curriculum evaluation efforts described earlier in this section. The Student Attitude Questionnaire (SATTQ) was administered to the same samples of students as the OVTCT and the results are reported by Schubert and associates. As a result of three efforts at using the SATTQ in assessing student attitudes toward the OVT Exploratory Program, Schubert and her coworkers were able to report that the students enjoyed the career exploration program. On a one to three response range for individual items, the students' mean scores for all items was above 2.00. Additionally, the students overwhelmingly responded that the program helped them make selections for further exploration in their eighth grade program. In 1971, only 18 out of 372, in 1972, only 9 out of 272, and in 1973, only 4 out of 325 students responded that the OVT program did not help them decide on which courses to take in the following year. For this study, the SATTQ items were grouped by subject matter discipline rather than being analyzed by individual items, this resulted in three separate attitudinal scores, one each for the areas of industrial arts, home economics, and business education. A total attitudinal score was obtained by combining the three subtotals.

Finally, three independent variables were chosen for this effort based on interviews with the students, teachers, and administrators of the OVT program. Student self-reports to three questions asking for measures of the amount of teacher, program, and peer influence were part of an instrument titled Teacher/Program/Peer Influence Inventory (T/P/P/II). Students were asked to circle the number from 0 to 10 (0 being the lowest) which represented the amount of influence each of these components had on their decisions to select or not select the career exploration courses for their eighth grade program. There were no research studies in the literature which reflected measures exactly like the T/P/PII. Smith (1962) found that teachers were a source of influence on sixth graders' occupational aspirations over a nine month period of time for some students, but not all students. He did not find a consistently significant relationship to the change in occupational aspirations of his subject by the teachers.

CHAPTER III

INVESTIGATIVE PROCEDURES

The major purpose of this investigation was to determine the interrelationships between and among selected urban preadolescents' personal and environmental factors influencing selection of career exploration courses and to analyze the emergent pattern of significant student factors influencing preadolescents' election of career exploration courses.

Population and Sample

The population from which the sample was drawn included the total number of seventh grade male and female students enrolled in Phase II of Pittsburgh, Pennsylvania's, OVT Exploratory Program during the months of May and June of 1973. With the exception of very few junior high school groups operating at that time under the former industrial arts and home economics type programs this represents all students from the Pittsburgh's middle schools. Additionally, one feature of the population was the inclusion of students from parochial and private schools within the city boundaries which have participated in cooperative time and facility sharing with the city public schools for many years. The population represents a cross section of races, social groups, economic levels, religious backgrounds, and ethnic origins. Within the limits of similar programmatic, sociological, and demographic boundaries, the results of this study are generalizable to other urban preadolescent populations.

A proportionally stratified random sample was selected from the parent population of 3,479 possible subjects using procedures explained by Blalock (1972, pp. 512, 517) and the random number tables furnished in his text (pp. 554-557). This particular sampling technique was utilized because of the need for data on educational center subsamples in proportions the same as in the population. Actual randomization was performed by a group of school secretaries having no connection or interest in the investigation. Subjects were drawn by intact groups representing an estimate of 13 to 14% of the total population. Sample attrition and incomplete data resulted in no less than a 9-10% sample size from the population for each instrument administered in the study.

Data Collection and Analysis Procedures

Investigative interviews and discussion sessions were held with the administrators, teachers, and students involved in the operation of Phase II of the OVT Exploratory Program during the months of January through April of 1973 in order to: (a) secure permission from the school system to conduct the study, (b) determine the administrators' perceptions of how the study would aid in an evaluation of their career exploration program, (c) obtain teacher input regarding possible usable variables and help establish a positive environment for their cooperation in administering the devices for the study, and (d) try out and discuss with the students several of the questions seen as having strong positive correlation with the dependent variables. As a result of these sessions several suggestions were included in the independent variable list and in investigator-designed affective inventories.

The proportionately stratified random sample was drawn from the population to locate which students, by intact groups, were participants in the study. The OVT Exploratory Program activities were conducted at five locations within the city. Two of these were large scale educational centers especially built and maintained for the career exploration program. Students from several public, parochial, and private schools were bused to these centers for laboratory sessions. Students participated in one morning or afternoon session per week during the entire school year. Other OVT educational centers were located in the regular schools to which students reported.

Next, a battery of seven instruments representing the variables of the study was assembled. The instruments were scheduled for administration on the basis of minutes required for each from information provided by the publishers; this helped equalize the amount of time required for each testing session. Typically, two instruments per session were administered with several make-up sessions included. Five building principals, two OVT supervisors, and twenty-two teachers were involved in this phase of the study. During this time period students were individually choosing which OVT courses they wished to explore in the eighth grade; this was done using preprinted and prepunched computer cards.

Data concerning student personal and environmental factors in this study were obtained from computer printouts provided through the cooperation of Pittsburgh school district central office administrators and the computer services department. The Computer Aided Pupil Accounting System revealed the name, birthdate, sex, race, address, and home school information. Student career exploration courses choices, the dependent variables in this study, were provided on a printout of the OVT Master Scheduling File system. Student choices were designated as first, second, third, or fourth and contained coded numbers signifying which course was selected for each choice.

Computation and compilation of all relevant student data was the next step. The OVI and JIM Scale instruments were self-contained devices. Responses to the VDI were made on standard C-1 machine scorable answer sheets. The OVI and VDI answer sheets were submitted to the Division of Instructional Services, The Pennsylvania State University for scoring and processing. The JIM Scale was scored by a College of Education secretary hired as a project aide. A 10% random sample check attested to the scorer's accuracy.

Several instruments in the study required intermediate processing steps before scores could be reported. For example, the Socioeconomic Status Inventory (SESI) contained information which provided the breadwinner's socioeconomic status score. Another project aide was instructed in the computation procedures for Hollingshead's Two Factor Index of Social Position, see Appendix C. Resultant computations for the total sample were individually reviewed by the investigator. Any disagreement in scores entailed a separate, detailed computation. The SATTQ and OVTCT devices were designed to permit maximum efficiency in answering by the preadolescent sample; this was accomplished by allowing students to merely circle desired responses. A third project aide was given the task of converting these student designated responses to machine scorable answer sheets for efficient processing. Finally, student responses to amount of teacher, program, and peer influence were gleaned from three specific items in the T/P/P II, see Appendix B.

Scores and coded designations for all variables in this effort, plus others for possible future use, were transferred to specially prepared forms. Keypunching information from these forms to computer cards in a standard format was the next step. Visual verification of the information on the punched cards was performed by cross-checking the card listing output to the original information forms.

Statistical analyses were the last steps. The total sample was analyzed for descriptive statistics and to determine the popularity of the career exploration courses. Following this, a card listing printout was visually scanned to determine those students with the necessary information to be included in the subsample. A total of 157 students from the larger sample were found to possess the required information.

Using just the subsample deck of cards, the final two statistical treatments were performed. The full subsample deck was used for the multiple regression analysis computations. Twelve MRA's were computed, one for each course. The QSASE computer library program from The Pennsylvania State University's Computational Center was utilized. A portion of the QSASE program printout included the needed Pearson product moment correlation values. Finally, an electro-mechanical sort divided the subsample into two groups per each career exploration course--those choosing it and those not choosing it. These card decks were then submitted to the STPAC subprogram titled UNPAIRED in The Computation Center's program library. Here the Behrens-Fisher t-tests were computed and printouts of the results were obtained.

Essential Data and Instrumentation

Independent Variables

To maximize the efficiency of the multivariate analysis used in this research effort, selected independent variables representing student personal and environmental factors were chosen on the basis of empirical and rational analyses. Empirical analysis for independent variable selection was presented in the related research studies discussed in Chapter II; rational predictor variable selection resulted from the aforementioned interviews and discussions. These independent variables will be presented in terms of the methods of their measurement and data dealing with the instruments.

OVT Achievement: Industrial Arts, Home Economics, Business Education.--These variables represent the subtest scores attained from the administration of the OVT Criterion Test (OVTCT). Developed by the American Institutes for Research with the aid of all OVT Exploratory Program teachers and used in three previous evaluation studies (Rosenfeld, Schubert, and Collins, 1971; Schubert and Rosenfeld, 1972; Schubert, 1973), the 45 item objective test appears to have sufficient content validity because of its unique development and subsequent uses. Means and standard deviations are available for two large scale administrations, however, no reliability data are available in the literature. Using the facilities and expertise of The Pennsylvania State University's University Division of Instructional Services, such item analysis and reliability data was computed for the OVT Criterion Test administered in this study. Kuder-Richardson 20 coefficients of reliability for the OVTCT subtests were: (a) Industrial Arts = .66, Home Economics = .73, and Business Education = .76. The K-R 20 reliability coefficient for the entire instrument was .87.

Age.--Chronological age expressed in months since birth.

Sex.--This is considered an essential variable because of the career education program's goal of breaking down traditional female and male attitude roles related to work.

Socioeconomic Status.--An expression of one's social and economic standing in a group, socioeconomic status has been assessed by analysis of father's occupational level and father's educational level. Sometimes place of residence is included in the analysis but this presents difficulties in data collection. By the same token, sometimes mother's occupational and educational level are used to determine socioeconomic status. In this study, due to the nature of the urban population involved, a more rational selection would be to use the breadwinner's occupational and educational levels. These data were obtained from student responses to a questionnaire asking for each designation, see Appendix A.

To obtain a single score representing socioeconomic status both parental scores were computed and the higher of the two, if two were provided, was used as the index of socioeconomic status. Specifically, Hollingshead's Two Factor Index of Social Position was utilized. Here the formula--7 x Breadwinner's Occupational Level + 4 x Breadwinner's Educational Level = Socioeconomic Status--yields a single scale score (Bonjean, Hill, and McLemore, 1967, p. 385).

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These same authors report that Hollingshead and others have conducted extensive studies on the reliability and validity of this scoring process.

Home School: Public or Parochial:--Because of the unique inclusion of parochial school students in the career exploration program conducted by the public schools and due to the lack of data about this environmental factor in career development literature, it was included as a variable in this effort. Data on home schools were obtained from the school district's file. Students' responses to the question: "My religion is . . ." represents this factor in the descriptive statistics analysis. Provision was made for students to check off one of three major religions, "None," or "Other" and name it.

Race.--Data from the school district's student personnel file yielded this information. Race was coded as White, Black, Spanish surname, Oriental, American Indian, or other.

The Age, Sex, Home School, and Race factors were obtained from a printout of the Computer Aided Pupil Accounting System (CAPAS) maintained by the Pittsburgh school district. Socioeconomic Status and Religion (for descriptive statistics) factors were secured from information provided by students on an inventory titled Socioeconomic Status Inventory (SESI). The SESI instrument used in this study appears in Appendix A.

Attitude of Program: Industrial Arts, Home Economics, and Business Education.--The instrument used to obtain students' attitudes of the three subdivisions of the career exploration program has been developed and used extensively in the aforementioned three evaluation efforts by the American Institutes for Research. Titled the Student

Attitude Questionnaire, the scores represent student feelings about each subject matter discipline in the OVT Exploratory Program. Item analysis, reliability, and factor analysis information was computed by The Pennsylvania State University's Division of Instructional Services.

The mean score for the Industrial Arts section was 11.66 with a standard deviation of 2.70; for Home Economics the mean score was 11.63 with a standard deviation of 2.60; for Business Education the mean score was 11.35 with a standard deviation of 2.37. The alpha reliability value for the Industrial Arts section was .76, for Home Economics it was .73, and for Business Education it was .62. The overall alpha value for the Student Attitude Questionnaire instrument was .82.

Motivation.--The instrument used to assess the construct of student achievement motivation was the Junior Index of Motivation (JIM Scale). The JIM Scale was developed by Frymier (1970) over a period of nine years. Essentially it is an easily administered, verbal, and reasonably short Likert response style instrument. Numerous studies by Frymier and his associates have standardized, validated, and normed the JIM Scale; he reports successful split half and test-retest reliability checks and normative data (1970, pp. 79-84).

Normative data for the "National Sample" seventh grade students in "Central City" areas include: (a) males; mean scale score of 115.26 with a standard deviation of 20.29, and (b) females; mean scale score of 121.26 with a standard deviation of 22.92. The split-half reliability coefficient for a random sample of seventh grade students was .74 for males and .78 for females.

Occupational Values: Interest and Satisfaction, Salary, Prestige, Security.--Occupational values are logically and empirically related to career course choices. The Occupational Values Inventory (OVI) instrument used to assess such values has been under development for several years. Impellitteri and Kapes (1971b) describe the instrument in *The Measurement of Occupational Values*. The feature of the OVI is the ipsative format which forces each student to actually perform valuing tasks while completing the device; assessing seven occupational values. On the basis of previous research, four of these values were selected for inclusion in the study as independent variables. Because of the valuing nature of the instrument, comparisons on a norm basis are inappropriate.

Vocational Attitude Maturity.--Crites' Vocational Development Inventory (VDI), Attitude Scale was the instrument used to assess this construct. The VDI, Attitude Scale is a simple, 50 item true-false paper and pencil device. The version used in this study is Form IV, the final research version; it has subsequently been published commercially under the name of Career Maturity Inventory. Crites (1971) reports extensive applications of the instrument and reveals construct and content validity and reliability; normative analysis at the seventh grade level is based on approximately 2,000 students.

Possible VDI Attitude Scale scores range from 0 to 50. Norms established for seventh grade students include: a mean score of 29.21, a standard deviation of 5.55, and a range of 15-44. The seventh grade test-retest stability coefficient is .70 which Crites feels satisfactory considering the developmental nature of vocational attitude maturity.

Influences: Teacher, Program, Peer.--The inclusion of these three measures of influence is a direct result of interviews conducted with administrators, teachers, and students prior to the data collection phase. Three specific questions asking for student self-reports were contained in an instrument specifically designed for this study titled the Teacher/Program/Peer Influence Inventory (T/P/PII). Students were asked to circle a number on a continuum of 0 (lowest) to 10 (highest) which reflected their perceptions of the amount of influence teachers, the program, or peers had in their career exploration decision-making. The T/P/PII instrument appears in Appendix B.

Dependent Variables

As discussed in Chapter I, the students in the Pittsburgh OVT Exploratory Program are asked to make four choices out of a possible ten career exploration courses that they wish to pursue for nine week periods each in their eighth grade program. Students in one education center were given the option of selecting, in addition to the regular ten courses, two experimental courses. It is assumed that students selected those courses from the possible alternatives in which they held high interest. For this reason, the most often chosen course from the possible twelve is called the most popular, the second most often chosen course the second most popular and down the list to the least popular career exploration course.

Actual student selection was performed using preprinted and prepunched computer cards. Students merely selected their first, second, third, and fourth choices of courses and placed the letter corresponding to each in the appropriately labeled square on the card.

This procedure was accomplished in a regular OVT Exploratory class session near the end of school year 1972-73. Records of student selections are maintained by the district's computer services department under the title of OVT Master Scheduling File.

Specifically, the list of twelve possible career exploration courses (before any statistical analysis, i.e., not in rank order of popularity) representing the twelve dependent variables of this study are:

Construction
Manufacturing
Visual Communications
Power and Transportation
Clothing and Textiles
Foods and Nutrition
Health and Community Services
Business Communications
Information Processing
Merchandising
Business Communications Simulation[1]
Home and Community Services[1]

Statistical Design

The statistical methodology used in this study was multiple regression analysis (MRA); both full and restricted models, Pearson product moment correlation, and Behrens-Fisher t-tests. Also, use of the FREQ 1 computer library program yielded simple descriptive statistics.

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[1] Experimental courses available only at one educational center.

The multiple regression model used in this study is in the following form:

$$y = b_o + b_1 x_1 + b_2 x_2 + . . . b_k x_k + e$$

where

y = dependent variable

$x_1, x_2 . . . x_k$ = predictor variables

$b_o, b_1, b_2 . . . b_k$ = partial regression coefficients

e = error term.

The specific equation used was:

$$y_1 = b_o + b_1 x_1 + b_2 x_2 + . . . b_{20} x_{20} + e$$

where

y_1 to y_{12} = career exploration course choices

and

x_1 to x_{20} = student characteristic variables.

The complete multiple regression analysis model with all relevant variables appears in Appendix C.

Use of the multiple regression technique allows the unique contribution of each variable to be tested for significance while holding the effects of all other variables constant. The assumptions underlying use of this statistical tool are given by Li (1967, p. 95):

1. Each array of y of the population follows the normal distribution.
2. The regression of y on x_1, x_2, . . . x_k is linear.
3. The variances of all arrays of y of the population are equal.
4. The samples are drawn at random.
5. The x values remain constant for all samples.

It should be noted that assumption number one is sometimes violated in this study. Non-normal distributions of the dependent variables are evident in terms of popularity of the twelve dependent variables. Where the study sample equally chose or didn't choose a career exploration course the normal distribution appears, i.e., 50% chose, 50% didn't choose. However, the less popular courses represent non-normal distributions, e.g., the ninth most popular course was selected by 25% of the students and not selected by 75%. To inspect this violation of a multiple regression assumption and describe students choosing the various courses, a Behrens-Fisher t-test was performed for the career exploration courses. This procedure tested for the significance of the differences of all the independent variable means between those students choosing a particular career exploration course and those not choosing that course. The STPAC library program at The Pennsylvania State University's Computational Center contains the specific program under the title of UNPAIRED.

In the multiple regression analysis the significance of the overall multiple R was tested using the F-distribution with the k and

N-k-1 degrees of freedom. This results in a test of the general overall null hypothesis that all partial regression coefficients are equal to zero. When the overall F is found to be significant and all partial regression coefficients are not equal to zero, each partial regression will be tested using the F-distribution with 1 and N-k-1 degrees of freedom. This results in a test of the hypothesis that $B_k = 0$. Alpha levels of .05 and .01 were used in describing each predictor variable's probable departure from a zero relationship.

Finally, a restricted model containing only those independent variables making a significant unique contribution to explaining the dependent variable was calculated and tested as previously indicated. This general procedure was followed for all twelve dependent variables in the study.

The computer program selected for this analysis was the one written by Hallberg (1969) and is under the title of QSASE at The Pennsylvania State University's Computation Center. This procedure, model, and computer program has been used extensively at The Pennsylvania State University in career development research conducted by various members of the faculty and staff of the Department of Vocational Education under the title Vocational Development Study.

When all twelve MRA's were computed and all significant independent variables determined they were plotted on the 23 independent variable x 12 dependent variable matrix; see Figure 1. Analysis of this completed matrix answers the research question of the study dealing with differential patterns among the student characteristics variables influencing career exploration course selections.

CHAPTER IV

PRESENTATION OF FINDINGS

Introduction

The findings of this research effort are reported in this chapter as they relate to the three research questions posed in Chapter I. Tables and figures are employed to present the statistical information necessary for providing the background and for answering the three questions.

In order to understand the sample for which the data were drawn, Table 1 is presented. Here it can be seen that the number of students completing one or more of the seven instruments of the study was 496, this represents 14.25% of the total number of students enrolled in Phase II of the OVT Exploratory Program at the time of this study. Slightly more than half of the total sample of students were males. The average age of the sample student was 13 years and 0 months. According to information obtained from the school records, 67.5% of the total sample were white and 33.6% were black. Interestingly enough, the sample included only one Oriental student and no Spanish surname or American Indian students. Based on information provided by students, 32.6% came from Protestant backgrounds, 48.2% were from Catholic, 8.2% Jewish, with 11.1% reporting "none" or "other" for their religious background. The home school information obtained from school records reveals that 69.7% of the total sample report to Pittsburgh public schools, 29.7% report to parochial schools

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TABLE 1

DESCRIPTIVE STATISTICS OF TOTAL SAMPLE (N = 496)

Variable	Subgroups					
Sex (N - %)	Male 258 52.23%	Female 236 47.77%	Missing Data 2 0.40%			
Age (in months)	$\bar{X}$ = 156.29 (13 yrs, 0 mos.)		Range = 143-183 (11 yrs, 9 mos. 15 yrs, 1 mo.)			
Race (N - %)	White 304 66.52%	Black 152 33.62%	Oriental 1 0.22%	Spanish Surname 0 0%	American Indian 0 0%	Missing Data 39 7.88%
Religious Background (N - %)	Protestant 124 32.63%	Catholic 183 48.16%	Jewish 31 8.16%	None or Other 42 11.05%	Missing Data 116 23.39%	
Home School (N - %)	Public 346 69.70%	Parochial 147 29.70%	Private 2 0.20%	Missing Data 1 0.20%		

within the Pittsburgh city boundaries, and just two students are from private schools within the city.

The criterion variable used in this study was choice or non-choice of career exploration courses for further and longer exploration in eighth grade after experiencing each of them briefly in the seventh grade. Table 2 shows the rank order of popularity of the twelve career exploration courses by the total sample of students. It should be noted that the eleventh and twelfth ranked courses were experimental and available to students at one OVT center. Of the ten career exploration courses available to all students, both the top three in popularity and the last three in popularity represent one course each from the disciplines of industrial arts, home economics, and business education. Of the five most popular career exploration courses three of them represent the industrial arts education field. The most popular career exploration course--foods and nutrition--and the second most popular course--visual communications--each represent courses typically thought of as being single sex-oriented courses at the middle/junior high school level.

Finally, background information for the research questions investigated in this study is contained in Table 3. Here means and standard deviations for all the independent variables are presented. This represents statisticas derived from data analysis of information taken from only those students who had completed all inventories and for whom the school records had appropriate data. Full data were obtained for 157 students and represents the subsample from which all other statistical techniques were performed. The rather high sample attrition rate could be attributed to factors in the study including:

TABLE 2

POPULARITY OF CAREER EXPLORATION COURSES BY TOTAL SAMPLE (N = 496)

Rank Order	Percent Choosing	Career Exploration Course Name
1	53.02	Foods and Nutrition
2	42.14	Visual Communications
3	40.73	Merchandising
4	37.50	Manufacturing
5	34.27	Construction
6	32.86	Clothing and Textiles
7	30.85	Business Communications
8	28.83	Health and Community Services
9	25.20	Power and Transportation
10	24.60	Information Processing
11	5.85[a]	Business Communications Simulations
12	5.24[a]	Home and Community Services

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[a] Experimental courses available at only one education center.

(a) the large number of inventories used, (b) end of school year activities at both the home school and the OVT center, e.g., the student carnival, the parochial school graduations, end of year assemblies, (c) reading levels of some of the devices might not have been sufficiently low for the students, and (d) student reluctance to complete paper and pencil instruments in a program that has many laboratory-type activities--especially instruments that ask somewhat personal questions about their socioeconomic background.

An inspection of Table 3 provides means and standard deviations for the twenty independent variables used in this study. The home economics subtest score on the OVTCT is almost three points higher than the subtest score for the courses representing the industrial arts and business education subject areas, the number of achievement test items was the same for each area. The age, sex, race, socioeconomic status, and home school variables each contain special notes required for their interpretation.

Although it is not a major aim of this study, the means for the scores attained on the VDI and JIM Scale can be compared to national norms. The mean Vocational Development Inventory, Attitude Scale score for the subsample in this study is 29.37 which is just slightly higher than the seventh grade national norm of 29.21, the standard deviation is slightly lower than the national figure. Different results appear for the Junior Index of Motivation (JIM Scale) scores. Here the subsample's mean score of 105.89 is lower than the seventh grade Mid-Atlantic norms for males of 115.51 and females of 124.06; however, the subsample's standard deviation is slightly less than three points lower than national figures.

TABLE 3

DESCRIPTIVE STATISTICS FOR THE 20 INDEPENDENT VARIABLES FOR THE SUBSAMPLE (N = 157)

Variable Name	Mean	Standard Deviation
OVT Achievement--Industrial Arts	7.87	2.82
OVT Achievement--Home Economics	10.00	3.06
OVT Achievement--Business Education	7.16	3.49
Age (in months)	156.30	6.16
Sex[a]	1.51	.50
Race[b]	1.18	.38
Breadwinners Socioeconomic Status[c]	45.45	11.24
Home School[d]	1.39	.49
Vocational Attitude Maturity	29.37	5.48
Motivation	105.89	20.25
OVI--Interest and Satisfaction	17.64	4.65
OVI--Salary	14.17	5.76
OVI--Prestige	12.90	4.06
OVI--Security	11.74	4.89
OVT Attitude--Industrial Arts	20.28	4.28
OVT Attitude--Home Economics	18.05	3.56
OVT Attitude--Business Education	17.41	3.28
Teacher Influence	3.22	2.74
Program Influence	4.16	3.13
Peer Influence	4.21	3.25

[a] Coded as 1 = Male, 2 = Female.

[b] Coded as 1 = White, 2 = Negro.

[c] Lower score means higher socioeconomic status, see supra, p. 52.

[d] Coded as 1 = Public, 2 = Parochial.

The four occupational value means from the Occupational Values Inventory are rather consistent with those reported by the instrument developers and with means reported in several of the monographs resulting from the Vocational Development Study being conducted at The Pennsylvania State University. Differences from reported norms are: (a) 0.13 lower on the value salary, (b) 0.37 lower for security, (c) 0.80 lower for interest and satisfaction, and (d) 1.53 higher for the value of prestige. Attitude toward the career exploration program grouped by major disciplines shows the industrial arts area having a two point higher mean score but with the highest standard deviation of the three subsection scores. Lastly, on a self-report scale of 0 to 10 with ten representing the most influence, the subsample means show that each of three influences was under the middle value 5; the table shows that the teacher influence score was lower than both program influence and peer influence.

Research Question Number One

Three research questions evolved from the statement of the problem and will be used as the basis for the presentation and interpretation of the data. The first research question was:

1. What are: (a) the interrelationships between and among twenty selected student characteristics from the cognitive, socioeconomic, and affective domains, and (b) the relationships between these characteristics and preadolescents' career exploration course choices?

Tables 4 and 5 present data which responds to the questions of intercorrelations between the independent variables and between the independent variables and the criterion of career exploration course selections ranked in order of popularity by the total sample. In answering part (a) of the question from Table 4 it can be seen that the range of intercorrelations is -.53 to + .66, with 58 significant relationships at the .01 level and an additional 17 relationships significant at the .05 level. However, few of the relationships are very strong in the positive or negative direction and the greatest amount of variance explained by the association of two of the independent variables is 44%. It should be noted when interpreting the table that as the relationship between any two variables increases the amount of contribution possible from either one in subsequent multiple regression analyses decreases.

As shown in Table 4, the independent variable home school (HOMSH) enters into no significant relationship with any other variable. Socioeconomic status (SES), attitude towards industrial arts (ATTIA), teacher influence (TEAIN), and peer influence (PERIN) also entered into very few significant relationships with other variables, and when they did they were rather weak relationships. The independent variables entering into the most number of significant relationships include: (a) achievement--industrial arts (ACHIA), (b) achievement--home economics (ACHHE), (c) achievement--business education (ACHBE), (d) vocational attitude maturity (VOATM), (e) motivation (MOTAV), (f) occupational value--prestige (PREST), and (g) attitude toward home economics (ATTHE).

To answer part (b) of question number one, it is necessary to examine the relationships of the twenty independent variables with

TABLE 4

INTERCORRELATIONS AMONG 20 INDEPENDENT VARIABLES FOR THE SUBSAMPLE (N = 157)

Variable Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. ACHIA	1.00																			
2. ACHHE	.46	1.00																		
3. ACHBE	.57	.66	1.00																	
4. AGE	-.27	-.28	-.17	1.00																
5. SEX	.10	.26	.17	-.05	1.00															
6. RACE	-.39	-.33	-.26	.15	-.08	1.00														
7. SES	-.08	-.19	-.21	-.01	.14	-.08	1.00													
8. VOATM	.47	.45	.48	-.13	.22	-.37	-.12	1.00												
9. MOTAV	.25	.30	.37	-.08	.26	-.26	-.01	.45	1.00											
10. INTSA	.16	.32	.28	-.07	.20	-.12	-.14	.26	.22	1.00										
11. SALRY	-.10	-.22	-.20	.01	-.04	.04	.16	-.13	-.13	-.53	1.00									
12. PREST	-.22	-.20	-.24	.09	-.15	.21	-.11	-.33	-.28	-.27	.04	1.00								
13. SECUR	-.17	-.27	-.15	.12	-.19	.10	.07	-.19	-.09	-.20	-.18	-.17	1.00							
14. ATTIA	.10	.04	.06	-.11	-.32	-.10	-.08	-.01	-.08	-.04	-.05	.02	.08	1.00						
15. ATTHE	.21	.27	.21	-.17	.38	-.02	.11	.20	.23	.12	.01	-.22	-.15	.20	1.00					
16. ATTBE	.08	.18	.20	-.16	.08	-.03	-.03	.15	.21	-.04	-.03	-.16	-.04	.31	.46	1.00				
17. HOMSH	-.07	.06	-.01	-.05	.04	-.13	.13	-.03	.05	.03	.13	-.02	-.12	-.12	.13	.04	1.00			
18. TEAIN	.05	.04	.02	-.05	-.13	-.13	.00	-.03	.07	-.08	-.01	.06	-.05	.08	.17	.22	.09	1.00		
19. FROIN	.20	.04	.04	-.03	-.00	-.10	-.01	.02	.08	.06	-.14	.03	-.02	.24	.17	.24	.02	.30	1.00	
20. FERIN	.07	.10	.06	-.09	.03	-.10	-.12	.17	.18	-.01	-.07	.03	-.09	.08	.15	.09	.02	.20	.20	1.00

$r \geq .157$ is significant at .05 level, $r \geq .20$ is significant at .01 level.

the criterion of career exploration course selections from the most popular to the least popular courses. These data are presented in Table 5. Inspection of this table reveals a total of thirty significant relationships at both the .01 and .05 levels. This represents something less than the expected number of significant relationships considering the number of variables used in the study. The range of relationships is from -.35 to + .28 and the largest amount of explained variance was found to be only 12.3%. Many of the other relationships yield much lower values for this factor. The variable socioeconomic status (SES) was scored with a lower value indicating a higher standing and, thus, the negative notation indicates a positive relationship. Overall, a number of significant relationships exist, but they are not evenly distributed among the variables.

Table 5 provides data that can be examined both horizontally and vertically. Looking at the career exploration course name columns shows only one course-information processing (INPRO) not entering into a significant relationship with any of the independent variables. The career exploration courses visual communications (VICOM), health and community services (HELCS), and business communication simulation (BUSCS) related significantly to any of the independent variables only once. Career exploration courses, foods and nutrition (FODNU) and construction (CONST) each related to five of the independent variables to a significant degree. Other courses related to two or three of the student characteristic variables.

Examination of Table 5 from the independent variable point of view shows that one cognitive measure--achievement in business education (ACHBE)--and the three occupational values of interest and

TABLE 5

CORRELATIONS BETWEEN THE 20 INDEPENDENT VARIABLES
AND THE CAREER EXPLORATION COURSES

Variable Name	1 FODNU	2 VICOM	3 MERCH	4 MFG	5 CONST	6 CLOTX	7 BSCOM	8 HELCS	9 POWTR	10 INPRO	11 BUSCS	12 HOMCS
ACHIA	.06	.18*	.08	-.09	-.14	.08	-.02	-.03	-.06	-.02	-.08	-.09
ACHHE[a]	.17*	.08	-.07	-.15	-.16*	-.10	.10	-.04	-.19*	-.06	.07	-.03
ACHBE	.05	.08	-.07	-.05	-.15	-.08	.11	-.01	-.13	-.03	.01	.03
AGE	-.16*	-.01	.01	.06	.00	-.05	-.08	.03	.09	-.01	.13	-.05
SEX[a]	-.06	.03	.01	-.35**	-.31**	-.08	.21**	.21**	-.23**	-.12	-.06	.05
RACE[a]	.08	-.12	.20**	.18*	.08	.16*	-.10	-.03	-.03	-.08	-.03	.01
SES	-.16*	-.15	-.04	-.09	.05	-.01	.08	.05	.08	.09	.04	.00
VOATM[a]	.16*	.07	-.12	-.21**	-.17*	-.01	.03	-.03	-.03	-.05	.28**	.18**
MOTAV	.05	.14	.19*	-.14	-.14	.00	-.02	-.09	-.09	.08	.02	.07
INTSA	.00	-.04	-.09	-.12	-.12	.12	.07	.02	-.06	.02	.09	.03
SALRY	.04	-.06	.01	.09	.09	.07	.02	-.07	.03	.07	.09	.03
PREST	-.08	-.07	-.08	.09	.13	.10	-.05	.09	-.06	.03	-.04	-.05
SECUR	-.20**	-.02	-.04	.08	.21**	-.02	-.14	.09	-.02	.05	-.05	-.15
ATTIA	.00	.07	.03	.15	.23**	-.01	-.14	-.04	-.14	.11	-.05	.01
ATTHE	.07	-.05	-.07	-.18*	-.02	-.14	-.15	.15	-.16*	-.08	-.11	-.05
ATTBE	.03	-.03	.10	-.06	-.05	-.00	.09	.04	-.11	.08	.11	.19*
HOMSH	.12	-.09	.07	-.03	.00	.01	.16*	.01	.03	.11	.08	-.09
TEAIN	.07	.05	-.13	.14	-.06	.06	.20**	.05	-.09	.09	-.15	-.21**
PROIN	.05	.11	.106	.10	-.07	-.28**	.07	.02	-.21**	-.08	.09	-.07
PERIN	.05	.08	.14	.04	-.09	-.18*	.06	.01	-.07	0.11	.00	.04

*Denotes r is significant at .05 level.

**Denotes r is significant at .01 level.

[a] These variables relate significantly to the career exploration courses most frequently.

satisfaction (INSTA), salary (SALRY), and prestige (PREST) do not relate significantly to any of the twelve career exploration courses. Achievement in industrial arts, age, socioeconomic status, motivation, attitude toward industrial arts, attitude toward business education, home school, and peer influence relate significantly to any one career exploration course at one time at either the .05 or .01 level. Sex and vocational attitude maturity relate significantly at either the .05 or .01 level more than any other variable--five times. To sum this table, we have seen that 12 of the twenty independent variables related to any one of the career exploration courses significantly only once or not at all. The highest number of times a student characteristic variable relates to all career exploration courses is five times. The overall picture is one of few significant relationships between any of the components, and those that do relate do so at a very low level; there are no moderately strong or high relationships in either direction between any of the independent variables and the twelve career exploration courses. One trend is for measures from the socioeconomic domain plus vocational attitude maturity to relate most often to the career exploration courses.

Research Question Number Two

The second research question posed by this study was:

2. To what extent can the variance in preadolescents' career exploration course selections be explained by student characteristics from the cognitive, socioeconomic, and affective domains for each of twelve courses?

In order to answer this question twelve multiple regression analyses (MRA) were run, one at a time on each dependent variable-career exploration course choice. After the full model MRA was run, a restricted model was computed in order to discover the influencing power of each independent variable. A full interpretation of the results will be provided for the first case; thereafter, simpler and shorter explanations will be provided.

In the case of the most popular career exploration course--foods and nutrition, an inspection of Table 5 reveals that five of the twenty independent variables are related significantly to the criterion. They are: achievement in home economics, age, socioeconomic status, vocational attitude maturity, and security. MRA was conducted in order to determine the amount of variance in course choice explainable from the independent variables. Results of the full model MRA are presented in Table 6. Here it can be seen that the total multiple correlation (R) is .449 and the coefficient of determination (R^2) is equal to .202. When the coefficient of determination is adjusted for degrees of freedom ($\bar{R}^2$) it drops sharply to .084.

The overall multiple R was tested for significance using the F-ratio with k and N-k-1 degrees of freedom. This tests the overall null hypothesis that all partial regression coefficients are equal to zero. The F-ratio is obtained to dividing the mean squares regression (MSR) by the mean square error (MSE). The overall F-ratio is 1.716 and it is significant beyond the .05 level.

The partial regression coefficient represents the amount of units of the independent variable which is uniquely associated with a one unit change in the criterion--election of foods and nutrition

TABLE 6

FULL MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THE 20 INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--FOODS AND NUTRITION

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ACHIA	-.002	0.125	-.013
ACHHE	.031	1.667	.192
ACHBE	-.023	1.399	-.162
AGE	-.010	1.554	-.128
SEX	-.133	1.366	-.136
RACE	.300	2.485*	.233
SES	-.007	1.754	-.150
VOATM	.017	1.800	.186
MOTAV	.001	0.262	.024
INSTA	-.017	1.427	-.157
SALRY	-.003	0.306	-.032
PREST	-.021	1.830	-.174
SECUR	-.021	2.167*	-.206
ATTIA	-.001	0.088	-.008
ATTHE	.004	0.260	.027
ATTBE	-.015	1.053	-.101
HOMSH	.136	1.626	.134
TEAIN	.008	0.519	.045
PROIN	.015	1.102	.095
PERIN	-.005	0.428	-.036

Standard error of estimate = 0.472.

Multiple correlation = .449.

Coefficient of Determination (R^2) = .202.

$\bar{R}^2$ Adjusted for degrees of freedom = .084.

F - Ratio = 1.716*.

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*Significant at .05 level.

career exploration course, exluding the effects of all the other independent variables. The Student's t value is obtained by dividing the partial regression coefficient by the standard error of the partial regression coefficient (not shown). This t value is compared to a tabled value of t with 1 and N-k-1 degrees of freedom. This results in a test of the significance of the partial regression coefficient. In this case the variables race and security were significant at the .05 level.

To summarize this full model MRA interpretation, it can be said that 20% of the variance in the choice of the career exploration course can be explained by all twenty of the student characteristics variables taken together. Furthermore, the variables race and security are significant contributors to the prediction model, the remaining eighteen variables do not possess enough unique amount of contribution to be significant.

In order to discover which variables possess the most information which is unique and useful in explaining the variance in the selection of the foods and nutrition, a restricted model of MRA was undertaken. Here, one variable at a time is omitted from the equation on the basis of its least amount of contribution to the equation. This variable elimination process continues until the regression coefficients of all the remaining variables are significantly different from zero at the .05 level.

Table 7 presents the results of the restricted model MRA. The overall multiple correlation (R) is .283 and the coefficient of determination (R2) is equal to .080. The adjusted coefficient of determination ($\bar{R}^2$) is .062, and the F-ratio equals 4.425 which is significant

TABLE 7

RESTRICTED MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THREE INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--FOODS AND NUTRITION

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
RACE	.218	2.030*	.170
VOATM	.017	2.230*	.189
SECUR	-.018	2.270*	.180

Standard error of estimate = 0.477.

Multiple Correlation = .283.

Coefficient of Determination (R^2) = .080.

$\bar{R}^2$ adjusted for degrees of freedom = .062.

F-Ratio = 4.425**.

---

*Significant at .05.

**Significant at .01.

at the .01 level. Thus, the restricted model MRA shows that a little less than half of the variance in foods and nutrition course selection can be attributed to the three variables of race, vocational attitude maturity, and the occupational value of security.

The second most popular career exploration course chosen was visual communications. An inspection of Table 5 reveals that only one independent variable relates significantly to the choice of the course --that is achievement in industrial arts; all other correlations are very low and many are negative. A full model MRA was computed and the results appear in Table 8. The overall multiple correlation is .377, with a coefficient of determination (R^2) of .142. When the coefficient of determination is adjusted for freedom it shrinks markedly to .016. The F-ratio is 1.125 and is not significant at the .05 level. The independent variables of socioeconomic status and the occupational value of interest and satisfaction have significant t values. Thus, all independent variables taken together account for 14.2% of the variance of election of the visual communications course.

Table 9 presents the restricted model MRA for determining which independent variables best explain the election of the visual communications course. Recall that the relationship, as tested with the F-ratio, was not a significant one. The overall multiple correlation (R) in the restricted model is only .179 with a coefficient of determination (R^2) of .032. Adjusted for degrees of freedom, the coefficient of determination ($\bar{R}^2$) is .026. The F-ratio is 5.140 and is significant at the .05 level. The only student characteristic with a significant t value is achievement in industrial arts. Comparing Tables 8 and 9 shows that all of the variables together can explain

TABLE 8

FULL MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THE 20 INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--VISUAL COMMUNICATIONS

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ACHIA	.034	1.737	.190
ACHHE	.001	0.074	.009
ACHBE	-.013	0.740	-.089
AGE	.002	0.308	.026
SEX	.127	1.237	.127
RACE	-.047	0.372	-.178
SES	-.008	2.002*	-.178
VOATM	-.010	0.996	-.107
MOTAV	.004	1.713	.167
INSTA	-.025	2.040*	-.232
SALRY	-.011	1.185	-.128
PREST	-.019	1.570	-.155
SECUR	-.010	0.982	.097
ATTIA	.014	1.224	.121
ATTHE	-.017	1.130	-.123
ATTBE	-.018	1.156	-.115
HOMSH	-.027	0.305	-.026
TEAIN	.002	0.149	.013
PROIN	.017	1.169	.104
PERIN	.002	0.118	.010

Standard error of estimate = 0.497.

Multiple correlation - .377.

Coefficient of determination (R^2) = .142.

$\bar{R}^2$ adjusted for degrees of freedom = .016.

F - Ratio = 1.125.

---

*Significant at .05 level.

TABLE 9

RESTRICTED MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN ONE INDEPENDENT VARIABLE AND CHOICE OF CAREER EXPLORATION COURSE--VISUAL COMMUNICATIONS

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ACHIA	.032	2.267*	.180

Standard error of estimate = 0.495.

Multiple Correlation = .179.

Coefficient of determination (R^2) = .032.

$\bar{R}^2$ adjusted for degrees of freedom = .026.

F -Ratio = 5.140*.

---

*Significant at .05 level.

14.2% of the variance of election of the visual communications career exploration course. In the restricted model MRA only the variable achievement industrial arts had a significant t value and it only explained 3.2% of criterion of course selection.

Merchandising was the third most popular career exploration course selected by the total sample. Race and motivation was shown to be significantly related to the merchandising course criterion. The full model MRA is presented in Table 10. The multiple correlation (R) is .410 with a coefficient of determination (R^2) of .168. The adjusted coefficient of determination ($\bar{R}^2$) is .046 which is due to expected shrinkage. The F-ratio is 1.374 and is not significant at the .05 level. The two independent variables with significant t values are race and motivation. This table shows that 16.8% of the variance in selection of the merchandising course can be explained by all twenty variables taken together.

Table 11 presents the restricted model MRA for the merchandising course election. Multiple correlation (R) drops to nearly half of the full model figure. The coefficient of determination (R^2) is .073 and adjusted for degrees of freedom ($\bar{R}^2$) it is equal to .061. The overall F-ratio is 6.032 and is significant beyond the .01 level. The two remaining variables most influencing course selection of merchandising are race and motivation. Thus, while the full twenty variables taken together explain 16.8% of the selection of merchandising, race and motivation alone account for a little more than half of that same criterion variable.

The fourth most popular course chosen by the total sample of students was manufacturing. An inspection of Table 5 reveals that

TABLE 10

FULL MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THE 20 INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--MERCHANDISING

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient	
ACHIA	.010	0.058	.009	
ACHHE	-.001	0.279	-.043	
ACHBE	-.001	0.687	-.057	
AGE	.000	0.327	.028	1
SEX	.021	0.157	.013	
RACE	.213	2.608*	.214	
SES	-.009	0.818	-.074	
VOATM	-.006	1.082	-.089	
MOTAV	.000	2.045*	.180	
INSTA	-.000	0.049	-.029	
SALRY	-.000	1.038	-.004	
PREST	-.001	0.024	-.002	
SECUR	-.000	0.263	-.002	
ATTIA	-.000	0.263	-.022	
ATTHE	-.001	0.646	-.055	
ATTBE	.002	1.645	.142	
HOMSH	.005	0.358	.030	
TEAIN	-.005	1.671	-.138	
PROIN	.002	1.201	.101	
PERIN	.002	1.399	.116	

Standard error of estimate = 0.488.

Multiple correlation = .410.

Coefficient of determination (R^2) = .168.

$\bar{R}^2$ adjusted for degrees of freedom = .046.

F -Ratio = 1.374.

---

*Significant at .05 level.

TABLE 11

RESTRICTED MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN TWO INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--MERCHANDISING

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
RACE	.193	2.498*	.194
MOTAV	.003	2.325*	.181

Standard error of estimate = 0.484.

Multiple correlation = .270.

Coefficient of determination (R^2) = .073.

R^2 adjusted for degrees of freedom = .061.

F -Ratio = 6.03**

---

*Significant at .05 level.

**Significant at .01 level.

variables sex, vocational attitude maturity, and attitude toward home economics each relate negatively and significantly to the selection of the manufacturing career exploration course. The full model MRA, Table 12, produces the following values: $R = .463$, $R^2 = .214$, $\bar{R}^2 = .099$, and F-ratio = 1.853. The F-ratio was significant at the .05 level. Significant t values were for the variables of sex and race. Table 13 represents the restricted model MRA for manufacturing. Values produced when the restricted model was computed are: $R = .383$, $R^2 = .146$, $\bar{R}^2 = .135$, and F-ratio = 13.148--significant beyond the .01 level. It was found that sex and race were the only two variables having significant t values. A comparison of the two MRA's computed for election of the manufacturing exploration course shows that taken together all variables explain 21.4% of the criterion of course selection while just the two variables of sex and race explain 14.6% of the influencing factor for the selection of the manufacturing career exploration course.

Construction was the fifth most popular course. The table of correlations shows the variables of achievement in home economics, sex, and vocational attitude maturity were related significantly and negatively while the occupational value security and attitude towards industrial were related significantly and positively to the construction course. Table 14 reports the full model MRA which presents these values: $R = .471$, $R^2 = .222$, $\bar{R}^2 = .108$, F-ratio = 1.940. The F-ratio was significant at the .05 level. Significant t values were reported for the variables sex (at the .01 level) and security (at the .05 level). Table 15 presents the restricted model MRA for this course. Here $R = .396$, $R^2 = .157$, $\bar{R}^2 = 135$, F-ratio = 7.071 (significant

TABLE 12

FULL MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THE 20 INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--MANUFACTURING

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ACHIA	.001	0.046	.005
ACHHE	-.003	0.138	-.158
ACHBE	.019	1.153	.132
AGE	.002	0.290	.024
SEX	-.228	2.339*	-.230
RACE	.251	2.001*	.187
SES	-.001	0.317	-.027
VOATM	-.012	1.237	-.127
MOTAV	.001	0.075	.007
INSTA	.003	0.270	.029
SALRY	.011	1.184	.123
PREST	-.007	0.580	-.055
SECUR	.001	0.140	.013
ATTIA	.012	1.068	.101
ATTHE	-.019	1.300	-.135
ATTBE	-.010	0.705	-.067
HOMSH	.011	0.137	.011
TEAIN	.022	1.443	.124
PROIN	.015	1.114	.095
PERIN	.010	0.826	.068

Standard error of estimate = 0.147.

Multiple correlation = .463.

Coefficient of determination (R^2) = .214.

$\bar{R}^2$ adjusted for degrees of freedom = .099.

F -Ratio = 1.853*

---

*Significant at .05.

**Significant at .01.

TABLE 13

RESTRICTED MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN TWO INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--MANUFACTURING

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
SEX	-.336	4.598**	-.340
RACE	.194	2.017*	.151

Standard error of estimate - 0.461.

Multiple correlation = .383.

Coefficient of determination (R^2) = .146.

$\bar{R}^2$ adjusted for degrees of freedom = .135.

F -Ratio = 13.198**

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*Significant at .05.

**Significant at .01.

TABLE 14

FULL MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THE 20 INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--CONSTRUCTION

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ACHIA	-.016	0.865	-.090
ACHHE	.004	0.205	.023
ACHBE	-.003	0.204	-.023
AGE	-.003	0.519	-.042
SEX	-.295	3.050**	-.299
RACE	-.027	0.224	-.021
SES	.002	0.657	.056
VOATM	.000	0.021	.002
MOTAV	.000	0.206	.019
INSTA	.010	0.871	.094
SALRY	.012	1.333	.138
PREST	.022	1.930	.182
SECUR	.023	2.377*	.224
ATTIA	.016	1.515	.143
ATTHE	.027	1.888	.196
ATTBE	.012	0.810	-.077
HOMSH	.004	0.050	.004
TEAIN	-.015	0.994	-.085
PROIN	-.012	0.838	-.071
PERIN	-.008	0.627	-.051

Standard error of estimate = 0.467.

Multiple correlation = .471.

Coefficient of determination (R^2) = .222.

$\bar{R}^2$ adjusted for degrees of freedom = .108.

F -Ratio = 1.940*.

---

*Significant at .05 level.

**Significant at .01 level.

TABLE 15

RESTRICTED MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN FOUR INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--CONSTRUCTION

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
SEX	-.309	3.839**	-.313
PREST	.019	1.964*	.154
SECUR	.020	2.556*	.200
ATTHE	.022	1.971*	.162

Standard error of estimate = 0.460.

Multiple correlation = .396.

Coefficient of determination (R^2) = .157.

$\bar{R}^2$ adjusted for degrees of freedom = .135.

F -Ratio = 7.071**.

---

*Singificant at .05 level.

**Significant at .01 level.

beyond the .01 level). Four variables significantly influenced the selection of the construction course. The variables sex, prestige, security, and attitude toward home economics all had significant t values. A comparison of the two tables for the construction course shows that while 22.2% of the variance of course election can be explained by all variables taken together, 15.7% of this same influencing factor can be explained by the four variables of sex, prestige, security, and attitude toward home economics.

Clothing and textiles was selected by 32.86% of the total sample and was the sixth most popular course. Inspection of Table 5 shows the variable of sex, program influence, and peer influence relate significantly to the selection of this course, the latter two do so negatively. Table 16 addresses itself to the full model MRA for this career exploration course. Values presented include: $R = .442$, $R^2 = .195$, $\bar{R}^2 = .077$, and F-ratio = 1.647 (significant at the .05 level). Only the variable program influence had a significant t value, it was at the .01 level. A comparison between the two MRA tables (16-17) for the clothing and textile course shows that there is a significant relationship between the independent variables and election of the course. All of the variables taken together explain 19.5% of career exploration course choice, while just the two variables of program and peer influence explain slightly more than half of the same influencing factor.

Business communications was the seventh most popular course choice. The variables sex, home school, and teacher influence emerge from the correlation table as being significantly related to selection of this course. Table 18 presents the results of the full model MRA.

TABLE 16

FULL MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THE 20 INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--CLOTHING AND TEXTILES

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ACHIA	.011	0.870	.071
ACHHE	-.011	0.814	-.066
ACHBE	-.027	1.940	-.163
AGE	-.033	0.568	-.045
SEX	.127	0.120	.010
RACE	.452	1.307	.112
SES	.009	0.576	.049
VOATM	.004	0.297	.025
MOTAV	-.000	0.038	-.003
INSTA	.016	1.205	.099
SALRY	.013	1.067	.086
PREST	.007	0.499	.041
SECUR	-.013	0.854	-.073
ATTIA	.004	0.276	.024
ATTHE	-.018	1.353	-.118
ATTBE	.002	0.192	.016
HOMSH	.302	0.543	.045
TEAIN	-1.600	0.768	-.066
PROIN	-.430	3.448**	-.282
PERIN	-.051	1.916	-.159

Standard error of estimate = 4.500.

Multiple correlation = .442.

Coefficient of determination (R^2) = .195.

$\bar{R}^2$ adjusted for degrees of freedom = .077.

F -Ratio = 1.647*.

---

*Significant at .05 level.

**Significant at .01 level.

TABLE 17

RESTRICTED MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN TWO INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--CLOTHING AND TEXTILES

Variables	Partial Regression Coefficients	Student's t	Beta Coefficient
PROIN	-.423	3.648**	-.278
PERIN	-.053	2.211*	-.168

Standard error of estimate = 4.449.

Multiple correlation = .330.

Coefficient of determination (R^2) = .109.

$\bar{R}^2$ adjusted for degrees of freedom = .097.

F -Ratio = 9.402**

---

*Significant at .05 level.

**Significant at .01 level.

TABLE 18

FULL MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THE 20 INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--BUSINESS COMMUNICATIONS

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ACHIA	-.025	1.415	-.150
ACHHE	-.014	0.792	-.093
ACHBE	.032	2.046*	.240
AGE	-.004	0.631	.053
SEX	.114	1.231	.123
RACE	-.164	1.432	.135
SES	.000	0.075	.006
VOATM	-.005	0.603	-.064
MOTAV	-.004	1.998*	-.188
INSTA	.002	0.156	.017
SALRY	-.002	0.223	-.024
PREST	-.003	0.232	-.022
SECUR	-.007	0.702	-.068
ATTIA	-.140	1.350	.128
ATTHE	.011	0.832	.087
ATTBE	.014	1.008	.096
HOMSH	.094	2.320*	.200
TEAIN	.041	1.777	.150
PROIN	.005	0.422	.035
PERIN	-.003	0.747	.095

Standard error of estimate = 0.451.

Multiple correlation = .432.

Coefficient of determination (R^2) = .187.

$\bar{R}^2$ adjusted for degrees of freedom = .067.

F -Ratio = 1.564.

---

*Significant at .05 level.

Values for the computed elements include: $R = .432$, $R^2 = .187$, $\bar{R}^2 = .067$, F-ratio = 1.564 and it was not found to be significant. Significant t values are reported for achievement in home economics and motivation. The restricted model MRA presented in Table 19 shows these values: $R = .325$, $R^2 = .106$, $\bar{R}^2 = .088$, F-ratio = 6.042 (significant at .01 level). In the restricted model, the variables sex, home school, and teacher influence had significant t values. Analysis of the two tables reveals that 18.7% of the variance in influence in career exploration course selection for business communication could be attributed to all variables taken together; more than half of that variance could be explained by just the three variables of sex, home school, and teacher influence.

Only the variable sex is significantly related to the eighth most popular career course selected by the total sample for increased exploration. Most of the other variables relate very weakly with this criterion. The full model MRA is presented in Table 20. Here the values of: $R = .396$, $R^2 = .157$, $\bar{R}^2 = .033$, and F-ratio = 1.267 are presented. As indicated, the F-ratio was not significant. The three values of sex, motivation, and prestige have significant t values. The restricted model MRA for the health and community services course is shown in Table 21. Multiple correlation is half of the full model at .230, $R^2 = .089$, $\bar{R}^2 = .461$, F-ratio = 5.005 which was significant at the .01 level. In this restricted model the variables sex, prestige, and security were shown to have significant t values. The comparison between the two MRA models for the health and community services course shows that 15.7% of the variance in the influence to choose or not choose it can be attributed to all twenty variables.

TABLE 19

RESTRICTED MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THREE INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--BUSINESS COMMUNICATIONS

Variable	Partial Regressions Coefficient	Student's t	Beta Coefficient
SEX	.186	2.599**	.199
HOMSH	.074	2.077*	.159
TEAIN	.018	2.499*	.191

Standard error of estimate = 0.446.

Multiple correlation = .325.

Coefficient of determination (R^2) = .106.

$\bar{R}^2$ adjusted for degrees of freedom = .088.

F -Ratio = 6.042**

---

*Significant at .05 level.

**Significant at .01 level.

TABLE 20

FULL MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THE 20 INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--HEALTH AND COMMUNITY SERVICES

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ACHIA	-.006	0.353	-.038
ACHHE	-.023	1.227	-.146
ACHBE	.015	0.887	.106
AGE	.002	0.262	.022
SEX	.227	2.338*	.238
RACE	-.194	1.626	-.156
SES	-.000	0.001	-.000
VOATM	.003	0.313	.034
MOTAV	-.005	2.021*	-.193
INSTA	.007	0.632	.071
SALRY	-.002	0.220	-.024
PREST	.023	2.022*	.198
SECUR	.018	1.858	.183
ATTIA	-.006	0.567	-.055
ATTHE	.028	1.886	.202
ATTBE	.007	0.462	.045
HOMSH	.020	0.472	.041
TEAIN	-.008	0.903	-.077
PROIN	-.005	0.411	-.035
PERIN	.001	0.256	.024

Standard error of estimate = 0.471.

Multiple correlations = .396.

Coefficient of determination (R^2) = .157.

$\bar{R}^2$ adjusted for degrees of freedom = .033.

F -Ratio = 1.267.

---

*Significant at .05 level.

TABLE 21

RESTRICTED MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THREE INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--HEALTH AND COMMUNITY SERVICES

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
SEX	.258	3.380**	.270
PREST	.019	2.069*	.165
SECUR	.016	2.147*	.172

Standard error of estimate = 0.461.

Multiple correlation = .230.

Coefficient of determination (R^2) = .089.

$\bar{R}^2$ adjusted for degrees of freedom = .461.

F -Ratio - 5.005**

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*Significant at .05 level.

**Significant at .01 level.

However, about half of that same variance can be attributed to the sex, prestige, and security variables.

Power and transportation is the ninth most popular course in the study. Achievement in home economics, sex, and program influence are all significantly and negatively related to the election of this course. Table 22 presents data from the full model MRA. Values include: $R = .460$, $R^2 = .211$, $\bar{R}^2 = .095$, F-ratio = 1.821 (significant at .05 level). Sex, security, and attitude toward industrial arts have significant t values. The values for the restricted model presented in Table 23 include: $R = .360$, $R^2 = .130$, $\bar{R}^2 = .113$, F-ratio = 7.594 (significant well beyond the .01 level). Sex, attitude, and program influence are the significant variables remaining in the model. The tabled values presented for power and transportation show 21.12% of the variance of the significant relationship in this course choice can be explained by all of the full model variables, while slightly more than half of that explainable variance can be attributed to the variables of sex, attitude toward industrial arts, and program influence.

The least popular course of the ten career exploration courses available for selection by all of the students is information processing. No variables are significantly related to this course as shown in Table 5, and further, most of the relationships are very small. As expected in the case where no relationships of significance are found before the MRA is computed, the reported values are low. In this case, as shown in Table 24: $R = .352$, $R^2 = .124$, $\bar{R}^2 = -.005$, F-ratio = 0.965 which was not significant. No variables which had significant t values resulted from the full MRA, one did emerge from the restricted model

TABLE 22

FULL MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THE 20 INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--POWER AND TRANSPORTATION

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ACHIA	-.001	0.062	-.007
ACHHE	-.021	1.797	-.206
ACHBE	-.001	0.043	-.005
AGE	.003	0.592	.048
SEX	-.266	3.346**	-.330
RACE	-.137	1.392	-.130
SES	.002	0.753	.064
VOATE	.002	0.327	.034
MOTAV	-.001	0.573	-.052
INSTA	-.009	0.919	-.100
SALRY	-.011	1.516	-.157
PREST	-.152	1.621	-.153
SECUR	-.016	2.003*	-.190
ATTIA	-.020	2.200*	-.208
ATTHE	.006	0.474	.049
ATTBE	.004	0.307	.029
HOMSH	.001	0.012	.001
TEAIN	-.014	1.114	-.096
PROIN	-.022	1.951	-.167
PERIN	-.000	0.045	-.004

Standard error of estimate = 0.384.

Multiple correlation = .460.

Coefficient of determination (R^2) = .211.

$\bar{R}^2$ adjusted for degrees of freedom = .095.

F -Ratio = 1.821*

---

*Significant at .05 level.

**Significant at .01 level.

TABLE 23

RESTRICTED MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THREE INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--POWER AND TRANSPORTATION

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
SEX	-.238	3.698**	.295
ATTIA	-.019	2.393*	-.197
PROIN	-.021	2.073*	-.162

Standard error of estimate = 0.381.

Multiple correlation = .360.

Coefficient of determination (R^2) = .130.

$\bar{R}^2$ adjusted for degrees of freedom = .113.

F -Ratio = 7.594**

---

*Significant at .05 level.

**Significant at .01 level.

TABLE 24

FULL MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THE 20 INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--INFORMATION PROCESSING

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ACHIA	.002	0.108	.012
ACHHE	-.006	0.331	-.040
ACHBE	.001	0.045	.006
AGE	.001	0.123	.011
SEX	-.054	0.571	-.059
RACE	-.087	0.745	-.073
SES	.004	1.200	.108
VOATM	-.005	0.536	-.059
MOTAV	.003	1.402	.137
INSTA	.013	1.154	.133
SALRY	.003	0.876	.096
PREST	.006	0.491	.049
SECIR	-.004	0.467	-.047
ATTIA	.013	1.220	.120
ATTHE	-.024	1.687	.184
ATTBE	.021	1.498	.148
HOMSH	.036	0.882	.079
TEAIN	.006	0.732	.064
PROIN	-.011	0.842	-.072
PERIN	.003	1.004	.098

Standard error of estimate = 0.458.

Multiple correlation = .352.

Coefficient of determination (R^2) = .124.

$\bar{R}^2$ adjusted for degrees of freedom = -.005.

F-Ratio = 0.965.

shown in Table 25. Here the attitude toward home economics had a significant t value. Put another way, the relationship between the total number of variables taken together explain 12.4% of the variance factor of course selection, while a combination of six variables explain 7.8% of the same variance, but neither model yielded significant F-ratios.

The two least popular courses represent experimental efforts being conducted by one OVT center. As such, and due to the fact that only seven subjects chose one and eight chose the other, the results of the MRA's both full and restricted model will appear in Tables 26, 27, 28 and 29 and will not be supplanted by any interpretative remarks.

Recall in Chapter III that one multiple regression analysis assumption was the assumption of normality of distributions of each array of Y of the population. Cases of non-normality of these distributions occur in this study when a disproportionate number of students did not choose a particluar OVT career exploration course. To check for the possible effects of this violation of the assumption a Beherens-Fisher t test was performed for the courses. The Beherens-Fisher's t test was especially chosen for this task because it does not require either same sample sizes nor equal variances. Concomitantly, these t test results help describe students choosing from those not choosing the OVT courses. Tables 30, 31, and 32 presents the results of the t tests of differences of means for each variable for the OVT courses. The subsample was divided into two groups: (a) those choosing the course in question, and (b) those who did not choose the course. Analysis of Tables 30, 31, and 32 shows that ten significant

TABLE 25

RESTRICTED MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN SIX INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--INFORMATION PROCESSING

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
SES	.005	1.570	.125
MOTAV	.003	1.589	.132
ATTIA	.013	1.491	.125
ATTHE	-.027	2.282*	.207
ATTBE	.017	1.339	.125
PERIN	.004	1.691	.134

Standard error of estimate = 0.447.

Multiple correlation = .280.

Coefficient of determination (R^2) = .078.

$\bar{R}^2$ adjusted for degrees of freedom = .041.

F -Ratio = 2.119.

---

*Significant at .05.

TABLE 26

FULL MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THE 20 INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--BUSINESS COMMUNICATIONS SIMULATION

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ACHIA	.035	0.518	.080
ACHHE	.001	1.258	.189
ACHBE	-.000	0.106	-.009
AGE	.000	1.596	.134
SEX	-.004	0.697	-.056
RACE	-.010	0.286	-.023
SES	-.000	0.007	-.001
VOATM	.008	3.465**	.282
MOTAV	.000	0.461	.040
INTSA	.001	1.017	.082
SALRY	.001	1.276	.104
PREST	-.000	0.321	-.026
SECUR	-.000	0.004	-.000
ATTIA	-.000	0.365	-.030
ATTHE	-.001	1.709	-.144
ATTBE	.001	1.551	.131
HOMSH	.005	0.819	.067
TEAIN	-.003	2.119*	-.172
PROIN	.001	1.308	.109
PERIN	.000	0.431	.035

Standard error of estimate = 0.199.

Multiple correlation - .443.

Coefficient of determination (R^2) = .197.

$\bar{R}^2$ adjusted for degrees of freedom = .078.

F -Ratio = 1.664*.

---

*Significant at .05 level.

**Significant at .01 level.

TABLE 27

RESTRICTED MODEL MULTIPLE REGRESSION ANALYSIS BETWEEEN THREE INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--BUSINESS COMMUNICATIONS SIMULATION

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
AGE	.000	1.971*	0.149
VOATM	.008	3.905**	0.296
TEAIN	-.003	2.142*	-0.162

Standard error of estimate = 0.196.

Multiple correlation = .354.

Coefficient of determination (R^2) = .125.

$\bar{R}^2$ adjusted for degrees of freedom = .108.

F -Ratio = 7.302**

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*Significant at .05 level.

**Significant at .01 level.

TABLE 28

FULL MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN THE 20 INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--HOME AND COMMUNITY SERVICES

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ACHIA	-.299	0.401	-.063
ACHHE	-.000	0.085	-.013
ACHBE	-.000	0.198	-.017
AGE	.000	0.625	.054
SEX	.003	0.418	.034
RACE	.018	0.497	.041
SES	.006	1.163	.105
VOATM	.004	1.597	.133
MOTAV	.000	0.723	.064
INSTA	-.000	0.364	-.030
SALRY	.000	0.463	.039
PREST	.000	0.670	-.055
SECUR	-.001	1.123	-.095
ATTIA	.000	0.005	.000
ATTHE	-.001	0.809	-.069
ATTBE	.001	1.850	.160
HOMSH	-.010	1.667	-.139
TEAIN	-.003	2.394*	-.198
PROIN	-.001	0.948	-.080
PERIN	.000	0.589	.049

Standard error of estimate = 0.216.

Multiple correlation = .401.

Coefficient of determination (R^2) = .161.

$\bar{R}^2$ adjusted for degrees of freedom = .037.

E -Ratio = 1.301.

---

*Significant at .05 level.

TABLE 29

RESTRICTED MODEL MULTIPLE REGRESSION ANALYSIS BETWEEN TWO INDEPENDENT VARIABLES AND CHOICE OF CAREER EXPLORATION COURSE--HOME AND COMMUNITY SERVICES

Variable	Partial Regression Coefficient	Student's t	Beta Coefficient
ATTBE	.001	2.264**	.176
TEAIN	-.003	2.511*	-.195

Standard error of estimate = 0.214.

Multiple correlation = .272.

Coefficient of determination (R^2) = .074.

$\bar{R}^2$ adjusted for degrees of freedom = .062.

F -Ratio = 6.161**

---

*Significant at .05 level.

**Significant at .01 level.

TABLE 30

BEHERENS-FISHER t-TESTS OF DIFFERENCES OF ALL INDEPENDENT VARIABLE MEANS BETWEEN STUDENTS OF THE SUBSAMPLE (N=157) CHOOSING AND THOSE NOT CHOOSING THE THREE MOST POPULAR CAREER EXPLORATION COURSES

Variable Name	Foods and Nutr.		Visual Comm.		Merchandising	
	t-Value	Sig.	t-Value	Sig.	t-Value	Sig.
Achievement-Industrial Arts	0.812	NS	2.250	*	0.491	NS
Achievement-Home Economics	2.114	*	0.988	NS	0.689	NS
Achievement-Business Education	0.575	NS	0.963	NS	-0.472	NS
Age	-1.951	NS	-0.130	NS	0.241	NS
Sex	-0.773	NS	0.386	NS	2.548	*
Race	1.049	NS	-1.500	NS	-0.277	NS
Socioeconomic Status	-2.045	*	-1.840	NS	-0.427	NS
Home School	1.509	NS	-1.093	NS	-1.371	NS
Vocational Attitude Maturity	2.022	*	0.835	NS	0.696	NS
Motivation	0.566	NS	1.782	NS	0.999	NS
Interest and Satisfaction	0.061	NS	-0.527	NS	-0.008	NS
Salary	0.524	NS	-0.792	NS	-1.472	NS
Prestige	-0.990	NS	-0.861	NS	0.049	NS
Security	-2.501	*	-0.246	NS	1.495	NS
Attitude-Industrial Arts	0.037	NS	0.897	NS	-0.409	NS
Attitude-Home Economics	0.891	NS	-0.590	NS	-0.028	NS
Attitude-Business Education	0.401	NS	-0.413	NS	-0.190	NS
Teacher Influence	0.865	NS	0.454	NS	-0.401	NS
Program Influence	0.692	NS	1.387	NS	0.650	NS
Peer Influence	0.577	NS	0.197	NS	-0.433	NS

*Significant at .05 level.

TABLE 31

BEHRENS-FISHER t-TESTS OF DIFFERENCES OF ALL INDEPENDENT VARIABLE MEANS BETWEEN STUDENTS OF THE SUBSAMPLE (N=157) CHOOSING AND THOSE NOT CHOOSING THE FOUR MIDDLE POPULARITY CAREER EXPLORATION COURSES

Variable	Manufacturing		Construction		Cloth & Tex.		Business Com.	
Name	t-Value	Sig.	t-Value	Sig.	t-Value	Sig.	t-Value	Sig.
Achievement-Industrial Arts	-1.120	NS	-1.655	NS	1.718	NS	-0.218	NS
Achievement-Home Economics	-1.845	NS	-2.027	*	3.545	***	1.234	NS
Achievement-Business Education	-0.617	NS	-1.938	NS	2.474	*	1.448	NS
Age	0.760	NS	0.025	NS	-0.512	NS	-1.014	NS
Sex	-4.701	***	-4.127	***	6.336	***	2.657	**
Race	2.129	*	0.992	NS	-1.138	NS	-1.408	NS
Socioeconomic Status	-1.132	NS	0.599	NS	2.128	*	1.029	NS
Home School	-0.405	NS	0.053	NS	-2.275	**	2.752	**
Vocational Attitude Maturity	-2.562	*	-2.092	*	2.983	**	0.329	NS
Motivation	-1.694	NS	-1.908	NS	3.596	***	-0.207	NS
Interest and Satisfaction	-1.448	NS	-1.519	NS	2.528	*	0.877	NS
Salary	1.076	NS	1.179	NS	-1.246	NS	0.287	NS
Prestige	1.069	NS	1.662	NS	-1.220	NS	-0.628	NS
Security	1.004	NS	2.167	*	-1.515	NS	-1.881	NS
Attitude-Industrial Arts	1.846	NS	3.091	**	-1.671	NS	-1.658	NS
Attitude-Home Economics	-2.227	*	-0.248	NS	2.660	**	1.835	NS
Attitude-Business Education	-0.734	NS	-0.649	NS	1.766	NS	1.196	*
Teacher Influence	1.720	NS	-0.776	NS	-1.138	NS	0.234	NS
Program Influence	1.188	NS	-0.869	NS	-1.702	NS	0.538	NS
Peer Influence	0.554	NS	0.272	NS	-0.716	NS	-0.907	NS

*Significant at .05 Level.
**Significant at .01 Level.
***Significant at .001 Level.

TABLE 32

BEHRENS-FISHER t-TESTS OF DIFFERENCES OF ALL INDEPENDENT VARIABLE MEANS BETWEEN STUDENTS OF THE SUBSAMPLE (N=157) CHOOSING AND THOSE NOT CHOOSING THE THREE LEAST POPULAR CAREER EXPLORATION COURSES OF THE TEN AVAILABLE TO ALL STUDENTS

	Health & Com. Ser.		Power & Trans.		Info. Processing	
Variable Name	t-Value	Sig.	t-Value	Sig.	t-Value	Sig.
Achievement Industrial Arts	-0.356	NS	-0.732	NS	-0.278	NS
Achievement-Home Economics	-0.597	NS	-2.317	*	-0.650	NS
Achievement-Business Education	-0.088	NS	-1.586	NS	-0.355	NS
Age	0.438	NS	1.057	NS	-0.172	NS
Sex	2.744	**	-3.110	**	-1.562	NS
Race	-0.356	NS	-0.375	NS	-1.076	NS
Socioeconomic Status	0.591	NS	0.927	NS	1.149	NS
Home School	-0.697	NS	0.308	NS	0.856	NS
Vocational Attitude Maturity	-0.315	NS	-0.444	NS	-0.664	NS
Motivation	-1.039	NS	-1.152	NS	1.014	NS
Interest and Satisfaction	0.255	NS	-0.795	NS	0.253	NS
Salary	-0.800	NS	0.306	NS	0.908	NS
Prestige	1.200	NS	-0.770	NS	0.689	NS
Security	1.160	NS	-0.215	NS	-0.597	NS
Attitude-Industrial Arts	-0.510	NS	-1.728	NS	1.500	NS
Attitude-Home Economics	1.937	NS	-1.694	NS	-1.061	NS
Attitude-Business Education	0.491	NS	-1.369	NS	1.026	NS
Teacher Influence	-0.315	NS	-1.207	NS	1.618	NS
Program Influence	-0.640	NS	-3.086	**	1.394	NS
Peer Influence	-0.131	NS	-0.835	NS	1.422	NS

*Significant at .05 level.
**Significant at .01 level.

independent variable mean score differences were found for the clothing and textiles groups, while no significant differences were found between the information processing groups.

Research Question Number Three

The third research question posed for the study was:

3. What are the patterns among student characteristics associated with preadolescents' career exploration course choices from the most popular course to the least popular course?

In order to answer this research question a twenty independent variables times twelve dependent variables matrix was developed. Figure 1 represents the matrix with the appropriate cells indicating when an independent variable with a Student's t value at the .05 level or the .01 level enters the full MRA model matrix as an important factor in explaining the amount of variance in career exploration course selections. Figure 2 represents the same matrix with those variables left in the restricted MRA's which had significant t values.

In both figures it can be seen that the following variables did not have significant influential power in career exploration decision-asking: (a) home economics achievement, and (b) the occupational value of salary. This is to say that these factors had absolutely no power as indicators of influence in course selections; they could have been omitted from the list of independent variables without loss of association power.

An examination of Figures 1 and 2 also indicates which variables are very weak indices of career exploration course decision-making by the sample. The following variables appear only once as significant variables in either the full or restricted MRA's across all twelve career courses: (a) industrial arts achievement, (b) business education achievement, (c) age, (d) socioeconomic status, (e) the occupational value of interest and satisfaction, (f) attitude towards business education, and (g) peer influence.

Four variables from the twenty selected for this study appear more frequently than others as indicators of amount of explainable variance in career exploration course choices by the preadolescent sample. Figures 1 and 2 show the variable sex to appear more often than other factors in career course choices, it significantly helps explain the selection of five career exploration courses. The occupational value variable security is a significant influencer in four occasions as shown in the figures. The next most frequent indicators of career course choices appear in the matrices for three times each; these are: (a) race, (b) motivation, and (c) teacher influence.

Other indicators of career exploration course choices include vocational attitude maturity, the occupational value of prestige, and attitude toward home economics; each of these factors were significant variables in the selection of two career courses.

Studying Figures 1 and 2 by groups of logically related variables helps answer research question number three. For example, it can be seen that the three achievement variables are, as a group, very weak explainers of career exploration course selections. In the restricted model of MRA's, shown in Figure 2, only one achievement subtest score--industrial arts--explains an appreciable amount of

		Cognitive Domain			Socioeconomic Domain					Affective Domain											
Rank Order	Career Exploration Course Name	Achievement-Industrial Arts	Achievement-Home Economics	Achievement-Business Education	Age	Sex	Race	Socioeconomic Status	Home School	Vocational Attitude Maturity	Motivation	Interest and Satisfaction	Salary	Prestige	Security	Attitude-Business Education	Attitude-Home Economics	Attitude-Industrial Arts	Teacher Influence	Program Influence	Peer Influence
1	Foods & Nutrition						.05								-.05						
2	Visual Comm.							-.05				-.05									
3	Merchandising						.05				.05										
4	Manufacturing					-.05	.05														
5	Construction					-.01									.05						
6	Cloth. & Textiles																			-.01	
7	Business Comm.			.05					.05		-.05										
8	Health & C.S.					.05					-.05			.05							
9	Power & Trans.					-.01									-.05			-.05			
10	Info. Process.																				
11	Bus. Com. Sim									.01									-.05		
12	Home & C.S.																		-.05		

NOTE: Direction of variables' significance taken from partial regression coefficient.

FIGURE 1

MATRIX OF INDEPENDENT VARIABLES OF SIGNIFICANT STUDENT'S t VALUE IN FULL MODELS OF MULTIPLE REGRESSION ANALYSIS FOR CHOICE OF ALL CAREER EXPLORATION COURSES

Rank Order	Career Exploration Course Name	Cognitive Domain			Socioeconomic Domain					Affective Domain											
		Achievement-Industrial Arts	Achievement-Home Economics	Achievement-Business Education	Age	Sex	Race	Socioeconomic Static	Home School	Vocational Attitude Maturity	Motivation	Interest and Satisfaction	Salary	Prestige	Security	Attitude-Business Education	Attitude-Home Economics	Attitude-Industrial Arts	Teacher Influence	Program Influence	Peer Influence
1	Foods & Nutrition						.05			.05					-.05						
2	Visual Comm.	.05																			
3	Merchandising						.05				.05										
4	Manufacturing					-.01	.05														
5	Construction					-.01								.05	.05		05				
6	Cloth. & Textiles																			-.01	-.05
7	Business Comm.					.01			.05										.05		
8	Health & C.S.					.01								.05	.05						
9	Power & Trans.					-.01												-.05		-.05	
10	Info. Process.																-.05				
11	Bus. Com. Sim.				.05					.01									-.05		
12	Home & C.S.															.05			-.05		

NOTE: Direction of variables' significance taken from partial regression coefficient.

FIGURE 2

MATRIX OF INDEPENDENT VARIABLES OF SIGNIFICANT STUDENT'S : VALUE IN RESTRICTED MODELS OF MULTIPLE REGRESSION ANALYSIS FOR CHOICE OF ALL CAREER EXPLORATION COURSES variance in preadolescents' course selection; in this case it was the visual communications course.

Two factors from the socioeconomic domain were frequent significant indicators of career decision-making. Race was a factor in choice of three of the top four career exploration courses in both models of MRA. Sex was an indicator of choices made by the students for five courses ranging in popularity from the fourth to the ninth. Contrastingly, age was an influential factor on one occasion only--the eleventh most popular course. Likewise, the socioeconomic status factor significantly associated with and explained course selection on one occasion--the visual communication course.

Two factors in the affective domain which were assessed by paper and pencil tests having national norms appeared as significant influential agents for a total of five times, but with no appreciable pattern evident. Still in the affective domain, it can be seen by an inspection of Figures 1 and 2 that the occupational value security is the most frequent value predictor of the criterion while salary does not show up as a significant predictor on any occasion. Interest and satisfaction value appears only once while prestige appears on three occasions. The occupational values of security and prestige tend to center on the fifth through ninth most popular courses.

Attitudes toward the subdivisions of the OVT program by discipline appear on the matrices only five times. Out of a possible seventy-two such chances to appear they collectively show up five times and in no distinct pattern. Teacher, program, and peer influence factors appear only on several occasions and always for the sixth most popular course or lower.

To summarize the answers to research question number three concerning emergent patterns of personal and environmental factors most often influencing the selection of career exploration courses it can be seen that the achievement variables are poor indicators of course choice, that the affective domain factors, although more in number, are the second most frequent occurring set of course choice indicators, and, finally, two factors in the socioeconomic domain proved to be the most frequently appearing factors in explaining the amount of variance in career course choices by the preadolescent sample. The factor of race occurred in three of the top four career courses in popularity while sex was a significant indicator for five of the six middle popularity courses from the fourth to ninth in rank order.

CHAPTER V

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Summary of Study

Career exploration programs are the segment of career education typically operating at the middle/junior high school level. One such program is the Occupational, Vocational, and Technical (OVT) Exploratory Program which has been operating since the late 1960's in the Pittsburgh, Pennsylvania public schools. In the OVT Exploratory Program, coeducational classes of middle school learners participate in a series of student-centered activities aimed at providing knowledge of occupational roles and identifying interests which enable them to make more effective occupational and educational decisions.

The purpose of this study was to investigate twenty selected personal and environmental factors which influence seventh graders' selection of career exploration courses for increased exploration in the eighth grade. Thus, this was a study of the interaction of personal and environmental factors involved in the career decision-making process of urban preadolescents.

This investigation involved several distinct phases. First, between the months of January through April, 1973, interviews and discussions were held with administrators and teachers of the OVT program in order to secure permission to conduct this study, ascertain the administrators' perceptions of how the research could aid them in program management, and establish a cooperative atmosphere between the researcher and teachers involved in the study. Additionally, interviews with the teachers and selected students suggested several important factors for consideration in the preparation of the instruments used in the study.

Second, from a population of 3,479 students enrolled in the seventh grade program--Phase II--a proportionately stratified random sample of approximately 14% students was drawn. The stratification of the sample sizes represented enrollment figures for five education centers where the activities were conducted. Expected sample attrition rate and missing data reduced the original sample of 496 students to a subsample of 157 for which complete information was available.

Third, a battery of seven paper and pencil tests was administered to the intact groups by their regular OVT teachers. In all, twenty-two teachers were involved in this portion of the data collection phase. A schedule was prepared for administering the devices that allowed minimum amounts or activity disruption in the career exploration courses.

Fourth, student data were obtained from printouts of the Computer Aided Pupil Accounting System. Data on the dependent variable in this study, career exploration course choices, were provided on a printout through the cooperation of several administrators in the Pittsburgh public school system.

Fifth, compilation of all scores on all inventories completed was performed. In several cases student responses to instruments were converted to machine scorable answer sheets and submitted to The Pennsylvania State University's Division of Instructional Services for processing. Item analyses, reliability checks, and factor analyses were computed for several measures.

After all data were keypunched on computer cards in a standard format, the statistical analyses phase began. Here the total sample was analyzed for descriptive statistics and then the subsample containing all necessary information was gleaned from a card listing. The subsample size numbered 157 students. Using the facilities of the Computational Center at The Pennsylvania State University and the FREQ 1, STPAC, and QSASE library programs the statistical treatments were performed.

Discussion and Conclusions

The specific findings of this effort were presented in the preceding chapter as they relate to the three research questions originally posed in the statement of the problem. This section will discuss these findings and derive conclusions which herein are to be considered within the framework of the assumptions made and with full understanding of the limitations stated earlier.

In response to the first part of question one dealing with the interrelationships among the total of twenty student personal and environmental factors, it can be said that a large number of significant relationships exists, in both positive and negative directions. However, few moderately strong relationshps were found, with the highest correlation coefficient found to be +.66.

The three cognitive domain variables, representing achievement scores for the subsections of the OVT Criterion Test, Phase II (OVTCT), enter into the most number of significant relationships; a total of thirty-five. Achievement in industrial arts correlates significantly to other variables in eleven cases, ranging from -.39 to +.57.

Achievement in home economics correlates significantly to other variables in fourteen instances ranging from -.33 to +.66.

Business education achievement as measured by the OVTCT correlated significantly to other independent variables in thirteen cases, ranging from -.26 to +.66.

In the socioeconomic domain relatively few and rather weak independent variable intercorrelations were found. For example, age correlated significantly with five other variables and in each case it was a negative relationship, the very narrow range was from -.28 to -.16. The variable sex correlated significantly a total of eight times, ranging from -.32 to +.38, while race correlated significantly six times with a range of -.39 to +.21 with only one positive relationship. Socioeconomic status correlated significantly only three times with a rather narrow range of -.21 to +.16. The variable home school (public or parochial) did not correlate significantly with any other variable.

The majority of the variables used in this study were from the affective domain. The vocational attitude maturity variable related significantly to the other nineteen variables in eleven cases ranging in values from -.37 to +.48. Motivation toward school work correlated significantly to other variables in a total of ten cases ranging from -.33 to +.45.

Four variables in this study represented occupational values. The occupational value prestige correlated most often with other factors--ten times; in every one of these cases the relationship was negative ranging from -.33 to -.16. The occupational value of security also related negatively to other factors a total of seven times with a very narrow range of -.27 to -.16. In contrast to the above two cases, the occupational value of interest and satisfaction correlated both negatively and positively a total of nine times ranging from -.53 to +.32. The occupational value of salary entered into five significant relationships ranging from a -.53 with the value of interest and satisfaction to a high of +.16.

Administration of the Student Attitude Questionnaire yielded three subscores which represented student feelings toward the three subject matter disciplines of the OVT Division of Pittsburgh schools. Attitude toward home economics related significantly to other variables in twelve cases ranging from -.22 (with the value of security) to +.46 (with attitude toward business education). Student attitude toward business education correlated significantly in nine cases ranging from -.16 to +.46. Industrial arts attitude correlated only four instances significantly with a range of -.32 to +.31.

Student self-reports of influences on their course choice decisions was the last group of variables included in this study. Taken together these three factors were the fewest correlates of significance. Program influence correlated significantly in a total of six instances, all positively, with a range of +.17 to +.30. Teacher influence correlated significantly four cases, again all positive, with a range of +.17 to +.30. Peer influence correlated three instances, all positive, with a very restricted range of +.17 to +.20.

To answer the second part (b) of question one, when the twenty independent variables were correlated with the twelve career exploration courses, somewhat different results were obtained. For such a large number of variables, only a total of thirty significant correlations appear and even these are rather low. The range of correlations was from -.35 to +.28.

The most popular career exploration course was foods and nutrition. Out of a possible twenty significant correlations five variables related significantly to the foods and nutrition course. They were: (a) achievement in home economics, (b) age, (c) socioeconomic status, (d) vocational attitude maturity, and (e) the occupational value of security. The range of correlation coefficients was from -.20 to +.17.

Construction was the fifth most popular career exploration course and the only other one which correlated significantly with five factors from the independent variable list. Correlated significantly with choice of the construction course were these factors: (a) home economics achievement, (b) sex, (c) vocational attitude maturity, (d) occupational value-security, and (e) attitude toward industrial arts. The correlation coefficient range was from -.31 (sex) to +.23 (security).

Career exploration courses manufacturing, clothing and textiles, business communications, power and transportation, and home and community services each have three independent variables correlated significantly to them. Vocational attitude maturity related significantly to three of these courses, program influence and sex related to two courses, and various other factors related significantly one time each; the range of all of these correlation coefficients was from -.35 to +.21. Merchandising was the third most popular course and the factor race correlated significantly with a coefficient of +.20 and the factor motivation had a coefficient of +.19.

Three career exploration courses had only one factor each correlate significantly to them. The visual communications course related to achievement in industrial arts with a coefficient of +.18, health and community services related with sex with a coefficient of +.21, while business communication simulation related with vocational attitude maturity with a coefficient of +.28.

Only the career exploration course-information processing failed to correlate significantly with any of the twenty personal and environmental factors which were the independent variables in this investigation.

The second research question of this study concerns the amount of explainable variance in the selection of career exploration courses that may be attributed to a combination of twenty selected preadolescents' personal and environmental factors. Table 33 presents this information in summary form. Six of the full model MRA analysis computations yielded significant relationships in the criterion variable from the total effects of the twenty independent variables. This is to say that in the other six courses reported the relationships may be attributable to chance occurrences. The range of explained variances by the full twenty personal and environmental factors was from 12.4% for the information processing course to 22.2% for the construction course. Many of these full model MRA's, as reported in the preceding chapter, revealed only a few variables to have much partial regression coefficient values and, likewise, few of the

TABLE 33

SUMMARY OF EXPLAINED VARIANCE OF THE CRITERION BY BOTH FULL AND RESTRICTED MODELS OF MULTIPLE REGRESSION ANALYSIS FOR ALL CAREER EXPLORATION COURSES

RANK ORDER	CAREER EXPLORATION COURSE NAME	FULL MODEL MRA		RESTRICTED MODEL MRA	
		Percent of Variance	Significance Level	Percent of Variance	Significance Level
1	Foods and Nutrition	20.2	.05	8.0	.01
2	Visual Communications	14.2	NS	3.2	.05
3	Merchandising	16.8	NS	7.3	.01
4	Manufacturing	21.4	.05	14.6	.01
5	Construction	22.2	.05	15.7	.01
6	Clothing and Textiles	19.5	.05	10.9	.01
7	Business Communications	18.7	NS	10.6	.01
8	Health and Community Services	15.7	NS	8.9	.01
9	Power and Transportation	21.1	.05	13.0	.01
10	Information Processing	12.4	NS	7.8	NS
11	Business Comm. Simulation	19.7	.05	12.5	.01
12	Home and Community Services	16.1	NS	7.4	.01

variables had significant Student's t-values.

The restricted model MRA's showed lower amounts of explainable variance. This is the result of including in the restricted model only those partial regression coefficients that were significant at the .05 level or better. The range of explained variances in the restricted MRA models was from 3.2% for visual communications to 15.7% for the construction course.

Research question number three is seen as being the capstone of this study, indeed the previous two questions provide data that is used as input for answering the third question dealing with emergent patterns the significant independent variables contributing most effectively to the criterion of course choice. These findings are reported in Figure 3.

Figure 3 shows that the variable sex was the most frequently appearing factor in preadolescents' career exploration course choices. Sex appears with significant Student's t-value a total of nine times and is a significant factor in the choice of five different courses ranging in popularity from the fourth to the ninth.

The factors of race and occupational value-security are the second most frequently appearing variables with significant explainable power in course choices--appearing six times each. Race was a significant explainer for three of the firstfour most popular courses while security was a significant indicator in the first, fourth, eighth, and ninth most popular courses.

An inspection of Figure 3 reveals that teacher influence and motivation appear with significant Student's t-value five and four times respectively and for three courses each. The teacher influence

Rank Order	Career Exploration Course Name	Cognitive Domain			Socioeconomic Domain					Affective Domain											
		Achievement--Industrial Arts	Achievement--Home Economics	Achievement--Business Educ.	Age	Sex	Race	Socioeconomic Status	Home School	Vocational Attitude Maturity	Motivation	Interest and Satisfaction	Salary	Prestige	Security	Attitude--Business Education	Attitude--Home Economics	Attitude--Industrial Arts	Teacher Influence	Program Influence	Peer Influence
1	Foods & Nutr.						*.05* .05			.05					*-.05* -.05						
2	Visual Comm.	.05						-.05				-.05									
3	Merchandising						*.05* .05				*.05* .05										
4	Manufacturing					*-.05* -.01	*.05* .05														
5	Construction					*-.01* -.01								.05	*.05* .05		.05				
6	Cloth. & Tex.																			*-.01* -.01	-.05
7	Business Comm.			.05		.01			*.05* .05		-.05								.05		
8	Health & C.S.					*.05* .01					-.05			*.05* .05	.05						
9	Power & Trans.					*-.01* -.01									-.05			*-.05* -.05		-.05	
10	Info. Process																-.05				
11	Bus. Com. Sim.				.05					*.01* .01									*-.05* -.05		
12	Home & C.S.															.05			*-.05* -.05		

NOTE: (1) Direction of variables' significance taken from partial regression coefficients.
(2) Where two values appear in one cell, Script Type denotes the significance in the full model MRA and Roman Type denotes the significance in the restricted model MRA.

FIGURE 3

COMPOSITE MATRIX OF INDEPENDENT VARIABLES OF SIGNIFICANT STUDENT'S t VALUE IN BOTH MODELS OF MULTIPLE REGRESSION ANALYSIS FOR CHOICE OF ALL CAREER EXPLORATION COURSES factor significantly helps explain the choice of the third, seventh, and eighth most popular courses.

Very weak indices of career exploration course choices by the sample include: (a) vocational attitude maturity, three times; (b) the value prestige, three times; (c) program influence, three times; (d) home school, two times; (e) attitude towards home economics, two times; (f) and appearing one time each are: industrial arts achievement, business education achievement, age, socioeconomic status, the value of interest and satisfaction, attitude toward business education, and peer influence. There is no readily apparent pattern among all of the weak indicators of career exploration course choices from the most popular to the least popular.

The factors of home economics achievement and the occupational value of salary had no significant influential power of career exploration decision-making; they could have been omitted from the independent variable list with no loss of prediction power in course choice for all twelve career exploration courses.

Using data obtained from Tables 30, 31, and 32; Figure 3; and descriptive statistics, profiles of the type of student typically selecting each career exploration course can be made. In this manner, the differences between those choosing a particular course and those not choosing the course can be described.

For example, foods and nutrition, the most popular career course, was chosen by ninety-three students of the subsample. Of those choosing to take this course for further exploration, 51.6% were males and 48.4% were females, 79.6% were white and 20.4% were Negro, and 57.0% were from the Pittsburgh school district while 43.0%

were from the Pittsburgh Catholic school system. None of these indices were significant differentiators between those selecting foods and nutrition and those not choosing the course. Four factors from the list of twenty independent variables distinguished between the choosers and nonchoosers. Those choosing the course: (a) had significantly higher (.05 level) mean scores on the home economics achievement subtest, (b) had significantly higher socioeconomic status scores (.05 level), (c) scored almost two points higher on the index of vocational attitude maturity for a significant difference (.05 level), and (d) scored significantly lower on the occupational value-security measure. On all of the factors other than aforementioned four, those choosing did not differ significantly from those not choosing. Thus, the typical student electing the foods and nutrition course for eighth grade is white eight out of ten times, and equally likely male or female and reports equally to either a Pittsburgh home school or Catholic home school. The typical student selecting foods and nutrition scored higher on the home economics achievement test, comes from a family with a higher socioeconomic standing, is more vocationally mature, and values security much less than the students not selecting this course for further exploration in the eighth grade.

Visual communications was the second most popular course having been chosen by eighty-two students from the subsample. Of this group 47.6% were males, 52.4% were females, 86.6% were white while 13.4% were Negro, 65.9% public school students while 34.1% were parochial students. None of these factors differentiated those selecting visual communications from those not selecting the course for further exploration in the eighth grade. The only factor from the twenty independent variables in this study that differentiated the two groups was achievement in industrial arts. Although the difference between the mean scores in industrial arts achievement was only one point this difference was significant at the .05 level. The typical student selecting visual communications is just as likely to be male or female, but almost nine times out of ten is white and two out of three are public school students. He scores consistently one point higher than others on the industrial arts achievement subtest.

The third most popular career-oriented course was merchandising; seventy-one students from the subsample chose it for eighth grade. Of this group 38.0% were males, 62% were females, 83.1% were white while 16.9% were Negro, and 67.6% reported to public schools while 32.4% reported to Catholic home schools. One of these factors distinguished the chooser from the nonchooser of the merchandising course. Sex significantly differentiated (.05 level) between the two groups; five times out of eight those selecting it were females. No other factor helped to significantly describe the groups' selection of the merchandising course.

The fifth most popular course among the ten available to all students was manufacturing. Sixty-six of the subsample group chose it for eighth grade. Of this group 69.7% were males, 30.3% were females, 74.2% were white, 25.8% were Negro, 63.6% had public home schools, and 36.4% had parochial home schools. Of these factors, sex was a very significant (beyond .001 level) indicator of group membership. It is much more likely that those selecting manufacturing are males. Race was also a significant (.05 level) indicator of those choosing the course; those selecting were more than likely of the Negro race. Two other factors differentiated between those taking manufacturing again and those not. Those electing the course for further exploration scored almost two points lower, as a group, on the measure of vocational attitude maturity (.05 significance level) and also scored significantly (.05 level) lower on the measure of attitude towards home economics. No other factor significantly differentiated between those choosing and those not choosing the career exploration course manufacturing. Thus, the typical student choosing manufacturing for eighth grade was a male seven out of ten times, more often than not he was a Negro youth, in five out of every eight cases he reported to a public home school, was less mature in the vocational attitude area, and had a lower attitude towards home economics than those not choosing manufacturing.

Sixty-five students of the subsample chose construction--the fifth most popular course. Males comprised 67.6% of those choosing, females were 32.3%, 78.5% were white while 21.5% were Negro, and 61.5% were public school students while 38.5% were parochial students. Of these factors, sex was a very significant (.001 level) differentiator between those selecting construction and those not choosing it. It is much more likely that the chooser is a male than a female. Also, those choosing the course: (a) scored significantly (.05 level) lower on the measure of vocational attitude maturity, (b) valued job security much more than nonchoosers (.05 level), and (c) scored significantly higher on the attitude toward industrial arts measure (.01 level). No other factors significantly distinguished those choosing construction from those not choosing the course for advanced exploration. The typical student selecting construction was a male in two of every three cases, eight of ten were white, and from a public school five out of eight times. This typical construction student was less mature in vocational attitude, valued job security more and had a much higher attitude toward the discipline of industrial arts than did a student not electing construction for the eighth grade.

Clothing and textiles was the sixth most popular course selected by the total sample and was chosen by fifty-three students of the subsample. Without a doubt, this course provides the most data in regards to differences between those choosing it and those not choosing. In all, nine factors had significant t-values between the two groups. For instance, sex was significant differentiator at the .001 level, only 18.9% of those selecting it were males while 81.1% were females. For the factor of race, 86.8% choosing were white while 13.2% were Negro. The factor of home school reveals that 73.6% are city school students while 26.4% are Catholic diocese students. Achievement in home economics was a very significant (.001 level) factor; those choosing scored nearly two points higher on this OVTCT subsection. Coupled with this was subject matter attitude which was also a significant (.01 level) factor; expectedly, choosers had more favorable attitudes towards home economics. Those electing this course scored very significantly (.001 level) higher on a measure of achievement motivation; close to fourteen points higher. Those choosing differed in that a significant number (.01 level) were public school students versus parochial school students. Also, a significant (.05 level) difference in socioeconomic backgrounds was evident with those choosing clothing and textiles coming from families with lower socioeconomic standing. Those choosing scored much higher on the measure of vocational attitude maturity. Last, two measures significant at the .05 level include achievement in business education (choosers scoring higher) and the occupational value of interest and satisfaction (choosers valuing it more). Thus, the typical student choosing the career exploration course clothing and textiles differs in many ways from those not choosing it. Typically, the student in eight of ten cases is a female, of the white race, three of every four are from a Pittsburgh home school, and from a lower family socioeconomic background than non-selectors. The typical student achieved much higher on the home economics subtest and, at the same time, holds a higher regard for this discipline than others. This typical selector had a much higher motivation attitude, was more vocationally mature, scored higher on the business education subtest, and valued interest and satisfaction more than did those not electing clothing and textiles.

Business communications was the seventh most popular course and was selected by fifty students from the subsample. More female (66.0%) than males (34.0%) selected it, 88.0% were white and 12% were Negro, and 46.0% were from public schools while 54.0% were from parochial schools. Three factors distinguish those electing it from those not electing it; sex and home school were significant (.01 level) factors. Also, choosers scored slightly higher (.05 level) than non-choosers on the business education attitude measure. The typical student electing business communications is two out of three times a female, seven out of eight times of the white race, and a little over half the time reports to a parochial school, and has a slightly more positive attitude toward the business education discipline. No other factors are significant indicators of whether or not a student would select or not select business communications for further exploration.

The eighth most popular course was health and community services. Of the fifty-five students selecting this course, 34.5% were males while 65.5% were females, 83.6% were white and 16.4% were Negro, and 65.5% had a public home school while 34.5% had parochial home schools. Sex was the only factor which significantly differentiated those choosing the course from those not choosing the course (.01 significance level). The typical chooser of health and community services was much more likely to be a female (two of every three), most likely a white youth, and two of each three are from a public home school. No other factor from the list of independent variables would help distinguish those choosing this course from those not.

Power and transportation was the ninth most frequently chosen career exploration course by the total sample. Thirty-two students from the subsample chose this course. Males comprised 71.9% of those choosing the course, females comprised 28.1% of the choosers. Of those electing the course, 84.4% were white, 15.6% were Negro, 59.4% had city school system home schools, and 40.6% reported to Catholic diocese schools. Three factors distinguished those electing the course from those not electing it. Sex significantly (.01 level) distinguished the groups; those choosing the course were much more likely to be male students. Also, those electing the course scored significantly (.05 level) lower on the home economics achievement subtest and on a self-report basis indicated that he was significantly (.01 level) less influenced by the program than were nonchoosers of the course. The student choosing power and transportation eight of ten times was a white male and six out of ten times went to a public school, he scored nearly two points lower on the home economics subtest, and reports that he was much less influenced by the program itself than those not choosing it for further exploration.

Of the ten career-oriented courses available to the total sample for increased exploration, information processing was selected by the least number of students. Forty-six students in the subsample selected the information processing course. Males comprised 58.7% of those electing it, 41.3% choosing it were females, 87.0% were white while 13.0% were Negro, 56.5% had public home schools while 43.4% had parochial home schools. None of these factors, nor any other factors investigated in this study, had significant t-values between those choosing information processing and those not choosing it. All that can be said is that the typical student choosing this course was more than likely of the white race; seven out of every eight students were white.

Based on the data collected, analyzed, and presented in this research effort the following conclusions are made:

1. The career exploration program described in this study has demonstrated that business education courses of an exploratory nature can successfully be implemented at the middle school level. Such courses can be as equally appealing to preadolescents as are courses from the "traditional" junior high school subject matter disciplines of industrial arts and home economics.
2. The career exploration program described in this study has successfully demonstrated that it is possible to design learning activities that appeal to all of the wide range of

physical growth patterns represented by the sample.

3. The career exploration program described in this study has successfully demonstrated that it is possible to design learning activities for preadolescents of various religious backgrounds and from varying levels of socioeconomic status.

4. The OVT Exploratory Program has been very successful in achieving the goal of reducing the notions of what is typically thought of as "man's work" and what is "woman's work" for the career exploration courses of foods and nutrition, visual communications, and merchandising.

5. The urban preadolescents in this study who were exposed to a year of career exploration activities chose courses for further exploration for a variety of reasons and were influenced by a mix of factors including values, interests, abilities, and socioeconomic variables.

6. Career exploration course selection by preadolescents is only moderately explainable by a study of the combination of personal and environmental factors included in this effort.

7. The factors sex, race, and occupational value-security were the most frequently appearing and also the most stable influencing variables on preadolescents' course selections in the career exploration program.

8. The occupational value of salary did not help predict the selection of any of the career exploration courses and any stress on importance placed on this value in the

career exploration activities would seem to be a waste of time and effort for both the students and their teachers.

9. Although significantly related to many other student characteristics, achievement on the subtests representing the three disciplines of industrial arts, business education, and home economics proved to be very weak influencing agents on career exploration course selections.
10. Students enjoyed the activities of the career exploration program described herein and responded favorably to attitudinal items about the program.
11. The OVT Criterion Test--Phase II used in this study was developed from test items supplied by the OVT teachers and administration of this instrument yielded a very satisfactory K-R 20 reliability coefficient of .87. However, the average number of items correctly answered was only 53.3%. The OVT Exploratory Program is not satisfactorily achieving its goal of effectively teaching official lists of student behavioral objectives for the career exploration courses.
12. After one full year of one half day a week sessions in career exploration activities, the students in this study scored only slightly higher (.16 of a point) than the national norm on the measure of the construct of vocational attitude maturity. It can be concluded that normative data on vocational attitude maturity as measured by the instrument used in this study does, indeed, vary from one sample to another sample.

Implications

The major conclusion derived from this study is that preadolescents' career course choices are dynamic and complex processes. A variety of interests, abilities, values, and socioeconomic factors are involved in the decision-making process. Few of the factors chosen as variables in this effort are consistent and stable influencing agents in preadolescents' course selections. Additionally, there were no strong, consistent patterns of factors affecting course choices from the most popular to the least popular.

The above conclusion and other findings of this study imply that Super's theory of career development does operate at the growth life stage. Certainly, none of the findings of this study are able to refute any of the propositions of his theory, supra, p. 23. This study has demonstrated that occupationally-oriented choices are very much influenced by reality factors. Sex and race were two of the three most frequent and most stable influencing factors on preadolescents' career exploration course choices. Data from this study has shown that the career development process is orderly, patterned, and somewhat predictable. The study has shown that vocational development at the growth stage is a dynamic process of compromise and synthesis. Super's proposition that although an occupation requires a characteristic pattern of abilities, interests, and personality traits the tolerances are wide enough to accommodate a variety of individuals is borne out by this study. Data presented here suggests that a wide range of ability, interest, value, and socioeconomic factors are being accommodated by many of the career exploration courses in the career education program described in this study. Also, the lack of clear, consistent patterns of influencing factors supports this proposition of Super's theory. This effort supports the portion of the proposition stating that occupational choices are related to an individual's interests and values and identification with role models, however no implications can be made concerning the role of community resources, level and quality of educational background, and the occupationsl structure, trends, and attitude of the community play in occupationally-oriented choices.

Super states in his theory of career development that "Self-concepts begin to form prior to adolescence, become clearer in adolescence, and are translated into occupational terms in adolescence (1957, p. 91)." Evidence from this study not only strongly supports this proposition, but suggests that it can be extended. Sex, race, and security were the three most frequent and stable influencing factors on career exploration course choices by the preadolescents of this sample. It is interesting to note that the sex and race characteristics are both ascribed rather than achieved factors. Kids are "stuck" with these two factors yet they most often influence career exploration decision-making. This implies that students view the process of occupationally-oriented decision-making as a chance to fulfill a need for their search for identify and self-concept fulfillment. Data presented here suggests that preadolescent students in the career exploration program utilize the chance to make free and open course choices as a chance to fulfill their need for role models. These role models appear in occupational terms through courses chosen, especially for the first through ninth courses in popularity.

Thus, while program managers strive towards the goal of reducing the notions of what are typical male roles and what are typical female roles, the preadolescents see this program as an opportunity to reinforce what they feel are adequate role models. Hence we can extend Super's statement to say that student self-concepts are translated into occupational terms *prior to adolescence* and during adolescence.

This study also substantiated the construct of vocational attitude maturity which is an important aspect of Super's theory of career development. Evidence presented here reveals that vocational attitude maturity, as measured by the VDI, successfully distinguished those choosing several career exploration courses from those not choosing the courses. Also, maturity of vocational attitudes was a significant influencing factor for several of the career exploration courses.

Several implications for career exploration programs in general and the OVT Exploratory Program in particular are derived from this study. First, the OVT Exploratory Program has successfully integrated business education courses of an exploratory nature into the middle school and this program should serve as a viable model of career education at this age level because the addition of these courses to the regular industrial arts and home economics courses more closely represents the world of work.

Second, the OVT Exploratory Program has successfully designed learning activities and career exploration courses that appeal to the whole range of physical growth patterns represented by the sample and, thus, this program should serve as a model for others seeking such curricula uniquely designed for the preadolescent learner.

Third, the OVT Exploratory Program has successfully designed learning activities and career exploration courses for students of several different religious backgrounds and from varying levels of socioeconomic status. The program could serve as an effective model for others who are confronted with similar demographic characteristics.

Fourth, the career exploration courses of foods and nutrition, visual communications, merchandising, clothing and textiles, information processing, business communications simulation, and home and community services were selected for further exploration by the subsample without the factor of sex being a significant influencing agent in the choice. Thus, the OVT program has been very successful in its goal of reducing what are thought of as traditional male and female roles for these courses. However, the program has been less successful for the other five courses and the administrators might study the "asexual" courses for clues as to their appeal to both sexes.

Fifth, administrators of the program should convey to the teachers that any stress or importance placed on teaching the value of salary associated with the career exploration courses is bound to be waste of time and effort because it is not an important influencing factor on any of the course choices. One can only speculate why this is so for the preadolescents of the sample. Perhaps it is a rejection of the materialistic values that have been a part of our culture for many years, or perhaps students of this age level are too busy establishing their self-concepts in the various courses of the program. This area seems worthy of more indepth analysis. However, this implication does not mean that instruction on knowledge and information about salaries associated with occupations should cease, the implication is that emphasis should be on the cognitive aspects of the topic and not on the affective component.

Sixth, students in the OVT program enjoy the courses and hold rather favorable attitudes toward them. But student performance on a teacher developed criterion-referenced objective test with a very satisfactory reliability coefficient was very poor. The average number of items correctly answered was only 53.3%. This represents a decline from the previously reported (1972) poor performance of only 61% average items correctly answered, supra, p. 34. The implication is that program administrators should investigate the congruence between what are the official lists of student behavioral objectives for each of the career exploration courses and the realities of what is being taught in the classrooms and laboratories. If the correlation between these two factors is high, then something needs to be done about revising the objectives, making them more realistic, or teacher effectiveness. Perhaps the teaching staff could profit from some type of inservice training program related to this issue.

Finally, the overall implication for the career exploration program that was the target of this study, and perhaps of other similar programs, is that the weight of influencing power thought to be associated with the learning activities of the various courses does not really exist. Of the ten career exploration courses available to all students only two of them were selected without a factor from the socioeconomic domain being a significant variable in the decision. This leaves something to be said about how educators view and approach the problem. It appears that a more direct approach to the structural factors of preadolescents' lives may have more impact in achieving the goals of the program. What is suggested here is that the application of the information derived from this study be implemented in the curricula as an effort to improve the career education program for preadolescents. Any curriculum decision-making in regards to revision or reorganization should be data-based; such data are provided in this effort.

Recommendations

Based on the results of this study the following recommendations are made:

1. The three achievement measures related significantly to many other variables but had little predictive power as a result of the MRA's. Therefore it is recommended that other factors from the cognitive domain be included in similar or replicative studies. A general ability factor could prove useful.
2. Indepth analyses should be conducted to ascertain why the factors of sex and race are so strong and important influencing factors in preadolescents' career exploration course selections.
3. Efforts should be made to improve the instruments designed to reflect the attitudes toward the subject disciplines involved and amount of teacher, program, and peer influence.
4. An investigation should be conducted to determine, if possible, why students in a planned program of career education for one full year scored only slightly higher than

the national norm for seventh graders on a measure of the construct of vocational attitude maturity.

5. The criterion variable used for the multiple regression analyses was whether or not subsample students selected a specific career exploration course. These courses were ranked in popularity based on data obtained from the total sample. It is recommended that an investigation be conducted with the subsample only and using the same personal and environmental factors but where the criterion is that of the students' first, second, third, and fourth choices of career exploration courses.
6. It is recommended that a similar study be replicated with other groups of preadolescent students in other schools, communities, and types of career exploration programs. In this manner a more complete and useful description of career development at the growth stage will become evident.
7. OVT program managers should maintain the records and data produced in this study and conduct investigations at other points in time (e.g., end of ninth grade, end of tenth grade, and senior year) with the same sample in order to research the longitudinal effects of the factors included in this study.

APPENDIX A

THE SOCIOECONOMIC STATUS INVENTORY

OVT EXPLORATORY PROGRAM, PHASE II

SOCIO-ECONOMIC STATUS INVENTORY (SESI)

Name________________________ Home School________________

Sex: (1)____Male (2)____Female Age: (1)___11; (2)____12; (3)___13;
(4)____14; (5)____Other

OVT Center (1)___Southside; (2)____Washington; (3)____Oliver;
(4)___Arsenal; (5)____McNaugher

Directions: Answer the following questions by filling in the blank when it asks you to or by placing an "x" on the line in front of the right group name.

1. Write in your father's occupation name or job title ______________ ________________________.

2. Check with an "x" the occupational group that your father belongs in:

   1. ___High executives, proprietors, major professionals
   2. ___Business managers, medium size business proprietors, lesser professionals
   3. ___Administrative personnel, owners of small businesses, minor professionals
   4. ___Clerical and sales workers, technicians, owners of little businesses
   5. ___Skilled manual employees
   6. ___Machine operators and semi-skilled employees
   7. ___Unskilled employees

   (Ask your teacher if you need help on this question)

3. Check with an "x" the highest educational level reached by your father:

   1. ___College completed
   2. ___College attended but not completed
   3. ___Technical, trade, or business school

   4. ___High school completed
   5. ___High school attended but not finished
   6. ___Attended elementary school only

4. Write your mother's occupation name or job title____.

5. Check with an "x" the occupational group that your mother belongs in:
   1. ___High executives, proprietors, major professionals
   2. ___Business managers, medium size business proprietors, lesser professionals
   3. ___Administrative personnel, owners of small businesses, minor professionals
   4. ___Clerical and sales workers, technicians, owners of little businesses
   5. ___Skilled manual employees
   6. ___Machine operators and semi-skilled employees
   7. ___Unskilled employees

6. Check with an "x" the highest educational level reached by your mother:
   1. ___College completed
   2. ___College attended but not completed
   3. ___Technical, trade, or business school
   4. ___High school completed
   5. ___High school attended but not finished
   6. ___Attended elementary school only

7. Whom do you feel provides the most or main financial support for your family?

   (1)___Father, (2)___Mother, (3)___Other

8. If "other" answered in number seven, name their relationship (brother, grandmother, etc.) ______________________________

9. My religion is:

(1) ___Protestant, (2) ___Roman Catholic, (3) ___Jewish

(4) ___All Others (Name:_______________________________)

10. My race is:

(1) ____White, (2) ___Black, (3) ___Oriental, (4) ___Spanish Surname, (5) ___American Indian, (6) ___Other

11. The name of the section of Pittsburgh that I live in is ____.

HOLLINGSHEAD'S TWO FACTOR INDEX OF SOCIAL POSITION

Computation Guide

OVT Exploratory Program Study

The Occupational Scale: a 7 point scale.

1. Higher executives of large concerns, proprietors, and major professionals
2. Business managers, proprietors of medium-sized businesses, and lesser professionals
3. Administrative personnel, owners of small businesses, and minor professionals
4. Clerical and sales workers, technicians, and owners of little businesses
5. Skilled manual employees
6. Machine operators and semiskilled employees
7. Unskilled employees

The Educational Scale: A 7 position scale.

1. Professional (M.A., M.S., M.D., Ph.D., Ed.D.)
2. Four year college graduate (A.B., B.S.)
3. 1-3 years college (also business schools)
4. High school graduate
5. 10-11 years of school (part high school)
6. 7-9 years of school
7. Under 7 years of school

Socioeconomic Status Formula:

Occupational level score x 7 + educational level x 4 = SES score.

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Example:  occupational score 3 x 7 = 21
          educational score  3 x 4 = 12
                         SES score = 33
```

PROCEDURE

1. Note father's job title on item No. 1, locate or determine which occupational group the job title belongs to.
2. Note student response to occupational group level on Item No. 2.
3. Determine which is correct occupational level, write the number down.
4. Note student response to father's educational level.
5. Compute father's SES index according to the formula, write the number in space at bottom, right side of page.
6. Turn to page two, complete steps one through five for mother's job title.
7. Write mother's SES index in space to right of Item No. 7.
8. Note the lower of these two scores, this is the breadwinner's SES, circle it.

APPENDIX B

THE TEACHER/PROGRAM/PEER INFLUENCE INVENTORY

OVT EXPLORATORY PROGRAM, PHASE II

TEACHER/PROGRAM/PEER INFLUENCE INVENTORY (TPPII)

Name______________________________Home School____________________

Sex: (1) ____Male (2)____Female Age: (1)___11; (2)___12; (3)___13;

(4)___14; (5)___Other

OVT Center (1)____Southside: (2)____Washington; (3)____Oliver;

(4)____Arsenal; (5)____McNaugher

Directions: You have been selected to help improve the OVT Exploratory Program. Your responses to the following questions will not be read by your OVT teacher. There are two kinds of questions on this inventory. The first kind asks "How many . . . ?" and then names something like "speakers, friends, etc." You are to circle the correct number under the question that answers what is being asked. The second kind of question asks you "How much do you feel . . . ?" and then names something. You are to think of the numbers below such questions as a scale of influence from 0, the lowest to 10, the highest. Circle the number on the 0 to 10 scale that best represents your feelings of how much an influence the item listed was. In both types circle the correct number. Don't skip any, there is no time limit.

PART I

1. How many OVT teachers have you had this year?

   0 1 2 3 4 5 6 or more

2. How many OVT teachers work in your OVT Center?

   0 1 2 3 4 5 6 7 8 9 10 or more

3. How many OVT teachers did you have this year before you made your 8th grade OVT course selections?

   0 1 2 3 4 5 6 or more

4. How many OVT teachers did you talk to about the 8th grade courses before you picked those you wanted?

0 1 2 3 4 5 6 or more

5. How many of the OVT teachers that you had did you enjoy?

0 1 2 3 4 5 6 or more

6. On a scale of 0 to 10 (0 being lowest), how much do you feel that your desire to have a certain teacher(s) in 8th grade OVT helped you choose the courses that you selected?

0 1 2 3 4 5 6 7 8 9 10

7. (Washington, South Side, Arsenal students) On a scale of 0 to 10 (0 being lowest), how much do you feel that learning about OVT from the same three teachers is more important than learning from one teacher in each area (nine teachers total)?

0 1 2 3 4 5 6 7 8 9 10

PART II

8. How many field trips have you gone on as part of your OVT activities?

0 1 2 3 4 5 6 or more

9. On a scale or 0 to 10 (0 being lowest), how much do you feel that what you learned on the field trip(s) helped you choose the 8th grade OVT courses you selected?

0 1 2 3 4 5 6 7 8 9 10

10. How many guest speakers did you have in your OVT classes this year?

0 1 2 3 4 5 6 6 or more

11. On a scale of 0 to 10 (0 being lowest), how much do you feel that the guest speakers influenced you to choose the 8th grade OVT areas you chose?

0 1 2 3 4 5 6 7 8 9 10

12. How many total products that you made in OVT were you able to eat or take home this year?

0 1 2 3 4 5 6 7 8 9 10 or more

13. How many of the products answered in question number 12 did you buy at the Mart?

0 1 2 3 4 5 6 7 8 9 10 or more

14. On a scale of 0 to 10 (0 being lowest), how much do you feel that the products you made or purchased at the Mart influenced you to choose the four OVT courses you picked to be in next year?

    0 1 2 3 4 5 6 7 8 9 10

15. How many days have you "cut" (skipped) OVT classes on purpose?

    0 1 2 3 4 5 6 7 8 9 10 or more

PART III

16. How many new kids did you meet or work with because of the OVT program?

    0 1 2 3 4 5 6 7 8 9 10 or more

17. How many "real buddies" or "super close friends" did you make because of the OVT program this year?

    0 1 2 3 4 5 6 7 8 9 10

18. How many new acquaintances did you help make products with in OVT during the whole year?

    0 1 2 3 4 5 6 7 8 9 10 or more

19. How many "old" buddies, friends before OVT classes began, did you work with this year in OVT activities?

    0 1 2 3 4 5 6 7 8 9 10 or more

20. On a scale of 0 to 10 (0 being lowest), how much do you feel that your desire to be with old or new friends influenced you in selecting the 8th grade OVT courses?

    0 1 2 3 4 5 6 7 8 9 10

21. If some factor other than your interest in the activities of the OVT courses, the OVT teachers,or your desire to be with friends influenced you to choose the 8th grade OVT courses, please name it ____

PSU--MLM, '73

APPENDIX C

THE MULTIPLE REGRESSION ANALYSIS MODEL

The multiple regression analysis model used in this study is in the following form:

$$y = b_o + b_1 x_1 + b_2 x_2 + . . . b_k y_k + e$$

where

y = dependent variable

$x_1, x_2 . . . x_k$ = predictor variables

$b_o, b_1, b_2 . . . b_k$ = partial regression coefficients

e = error term

The specific equation used was:

$$y_i = b_o + b_1 x_1 + b_2 x_2 + . . . b_{20} x_{20} + e$$

where

y_1 = most popular course choice

y_2 = second most popular course choice

y_3 = third most popular course choice

y_4 = fourth most popular course choice

y_5 = fifth most popular course choice

y_6 = sixth most popular course choice

y_7 = seventh most popular course choice

y_8 = eighth most popular course choice

y_9 = ninth most popular course choice

y_{10}= tenth most popular course choice

y_{11}= eleventh most popular course choice

y_{12}= least popular course choice

and

x_1 = OVT Achievement-Industrial Arts
x_2 = OVT Achievement-Home Economics
x_3 = OVT Achievement-Business Education
x_4 = Age
x_5 = Sex
x_5 = Race
x_7 =Breadwinner's Socioeconomic Status
x_8 = Home School
x_9 = Vocational Attitude Maturity
x_{10} = Motivation
x_{11} = Occupation Value-Interest and Satisfaction
x_{12} = Occupational Value-Salary
x_{13} = Occupational Value-Prestige
x_{14} = Occupational Value-Security
x_{15} = OVT Attitude-Industrial Arts
x_{16} = OVT Attitude-Home Economics
x_{17} = OVT Attitude-Business Education
x_{18} = Teacher Influence
x_{19} = Program Influence
x_{20} = Peer Influence

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